

# 2018 PIERCE ENGINE



**ENFORCER**

Revised 11/20/19



This document and additional reference documents regarding this breed of apparatus are available at:

<https://www.montgomerycountymd.gov/mcfrs-psta/driver/DriverTrainingPierceEnforcer.html>

# Key Differences - Crimson vs. Pierce



- No Compressed Air Foam System (CAFS)
  - No compressor
- No rotary vane primer or selector lever for intake priming
- No AC generator or power inverter
  - 12v DC scene lights
- No Class B foam cell
- No AutoFill on any intake
- No pressure relief valve on large diameter discharges
- Manual valve on the tank-to-pump

# Dimensions



- Overall height: ?
- Overall width: ?
- Overall length: ?



Beware that the cab entry steps protrude from the body



# Weight



- Gross Vehicle Weight Rating: 47,800lbs
- Actual Weight
  - Engine 712 with equipment – January 2019
    - ✓ Front driver side – 7,850lbs
    - ✓ Front officer side – 7,850lbs
    - ✓ Rear driver side – 12,400lbs
    - ✓ Rear officer side – 11,800lbs
    - ✓ Total actual weight – 39,900lbs



# Safety Systems



- **Automatic Traction Control (ATC)**
  - applies the service brake to a spinning wheel so that the torque can be transferred through the differential to the wheel that has the traction
  - reduces engine torque when both wheels are spinning to improve traction
  - ATC light located in the cab will light when the ATC feature is active
  - May be momentarily disengaged by “Offroad Traction” switch
- **Electronic Stability Control (ESC)**
  - stabilizes the vehicle during cornering maneuvers
  - Compares where you are steering and where the vehicle is actually going
  - Intervenes by applying the brakes to individual wheels asymmetrically in order to create torque about the vehicle's vertical axis
  - system may reduce engine power or operate the transmission to slow the vehicle down
- **Frontal impact protection systems**
- **Side roll protection systems**

See the [Pierce Saber/Enforcer Operator's Manual](#) for additional information.

# Powertrain Systems



- Motor: Cummins L9 450hp
- Transmission: Allison 4000 EVS 5-speed
  - TES-295 synthetic fluid
- Maximum speed is 68mph
- Motor oil and transmission fluid checks via access panel crew area of cab
- Transmission level is also checked via the keypad



# Transmission Fluid



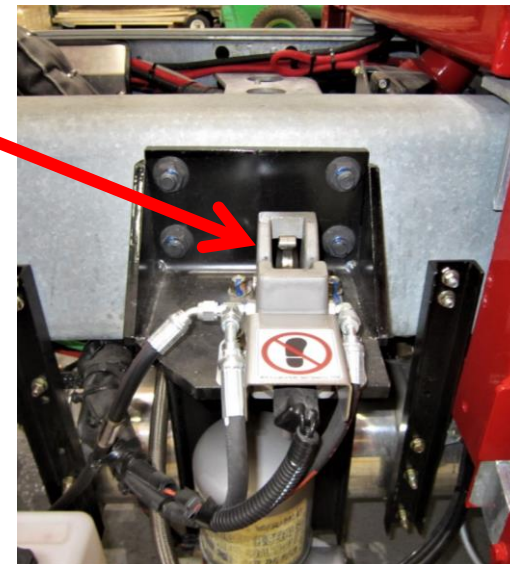
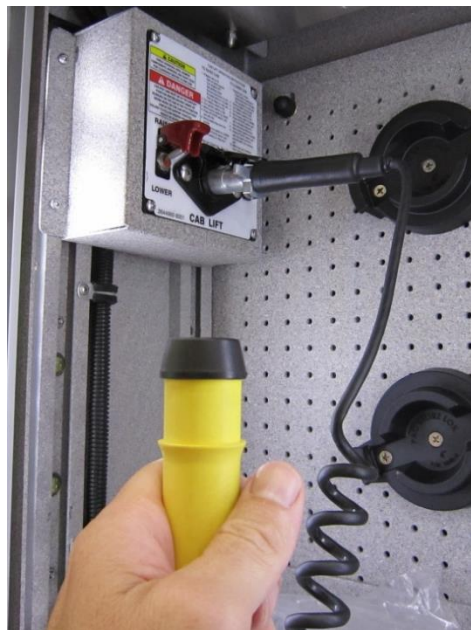
- Fluid level check
  - Selector in Neutral
  - Temperature 140 to 220°F
  - Engine at idle and parked for >2 minutes
  - Level ground
- Press both arrow buttons simultaneously to check fluid level; status displayed on selector pad screen
- OL will be followed by OK, -1 thru -7, or +1 thru +7.
  - The – indicates under filled and the + indicates overfilled.
  - The numeral indicates the number of quarts.
- Any other message indicates a problem and CMF should be notified.
- Always confirm the digital reading by visually checking the dipstick BEFORE adding fluid.



# Cab Tilt



- Cab locks are not easily visible nor is there is a discernible sound to verify engagement
  - Control located in the first driver's side body compartment
  - Two options:
    - Use the handheld controller
    - Use the toggle switch on the control box (useful if the handheld is lost or malfunctioning)



*Cab lock mechanism – forward of pump housing*

**Always secure loose items in the cab and verify clearances BEFORE tilting the cab!**



# Cab Tilt



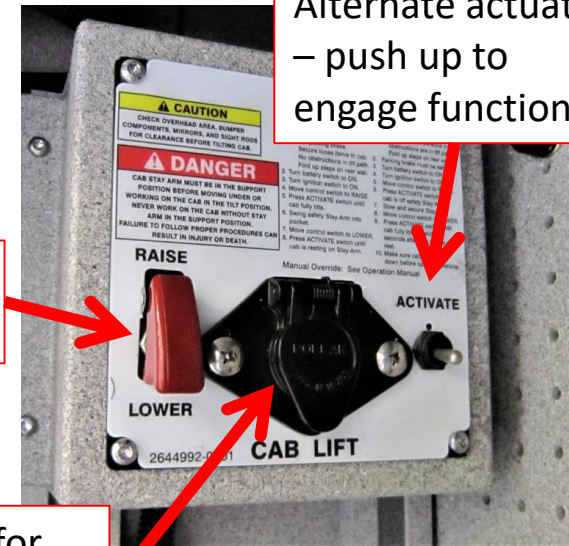
1. Turn on battery and ignition switch
2. Secure loose items in the cab
3. Verify overhead and forward clearances
4. Select function using "raise/lower" switch
  - Switch with red cover
5. Plug in handheld cab tilt actuator
  - Serves single function – to activate the function selected
6. Position to view the area around and ahead of the cab
7. Engage the raise/lower function by pressing the actuator button

If the handheld actuator is not available, the toggle switch marked "activate" serves the same purpose

Raise/lower selector

Plug for handheld actuator

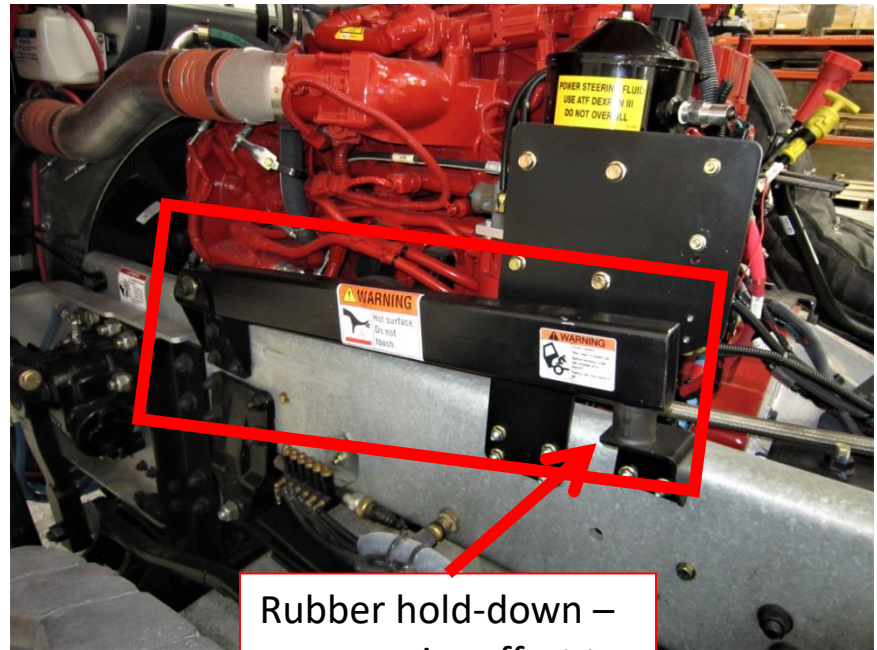
Alternate actuator – push up to engage function



# Cab Tilt – Safety Arm



- Locking safety arm located on driver's side lift cylinder
- Stowed atop the frame rail beside the motor
  - Metal becomes **HOT** as motor compartment heats up – use gloves to handle
  - No cables to pull or latches to operate
  - Held down by a rubber stopper during storage



Rubber hold-down – may require effort to dislodge from storage

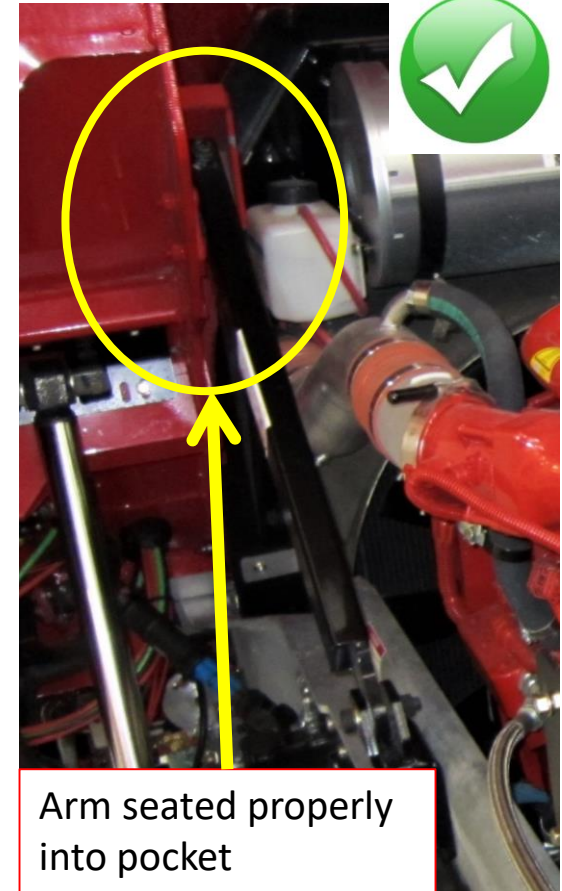
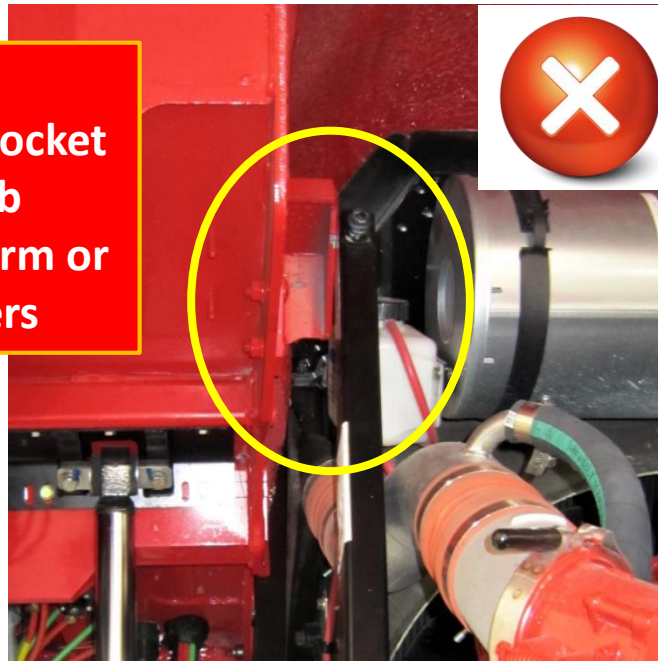
# Cab Tilt – Safety Arm



- Drops into a pocket ahead of the wheel well
  - Be sure to verify the arm lands in the pocket – hinge has a loose tolerance and may let the arm fall outside

## **DANGER**

**Arm is not in the pocket  
Not holding the cab  
May damage the arm or  
cab if the cab lowers**



**Arm seated properly  
into pocket**



# Cab Tilt



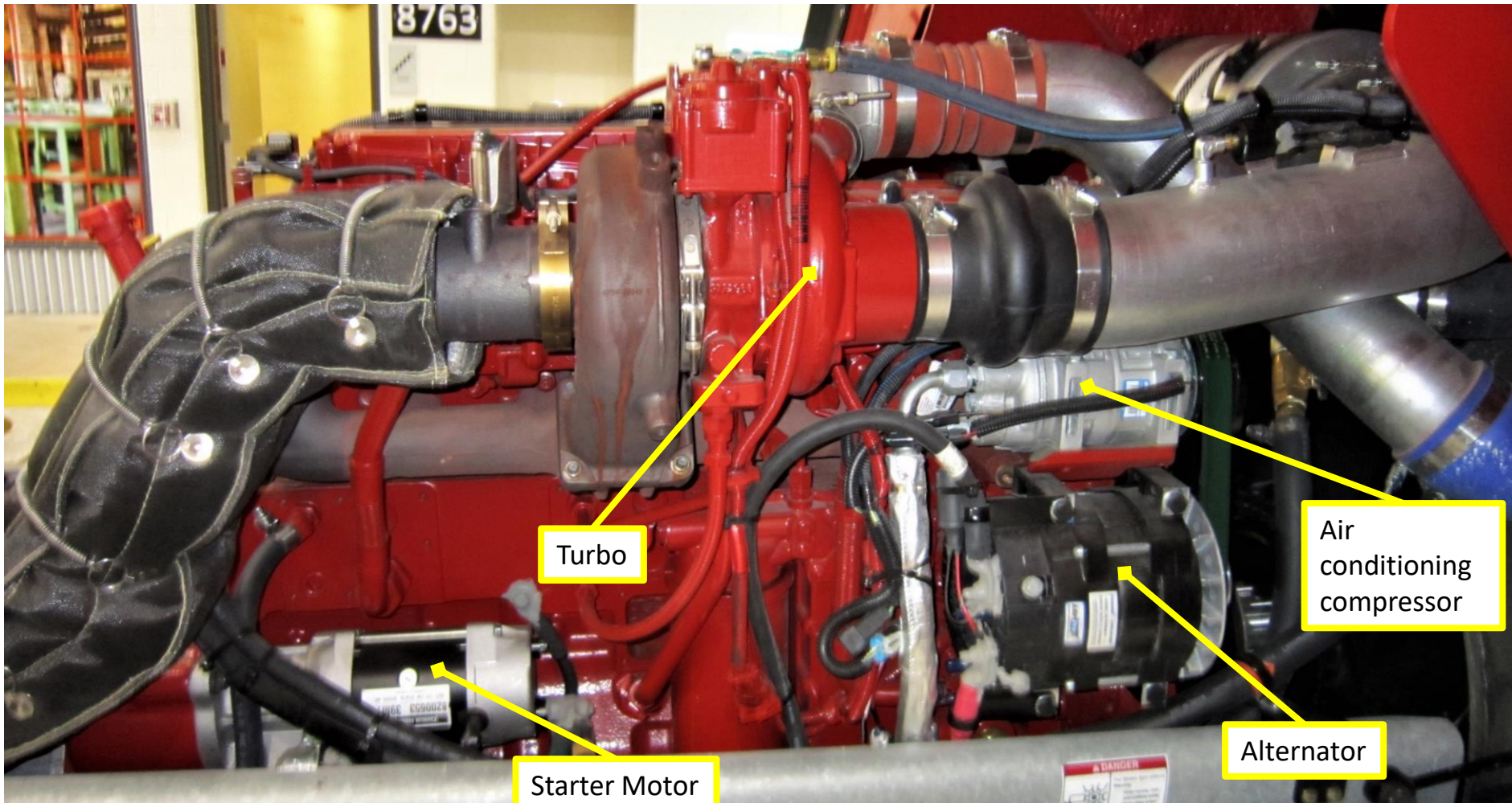
**Always....verify  
clearances, secure  
loose items, and  
engage the safety  
arm**



Watch the clearance  
of this mirror

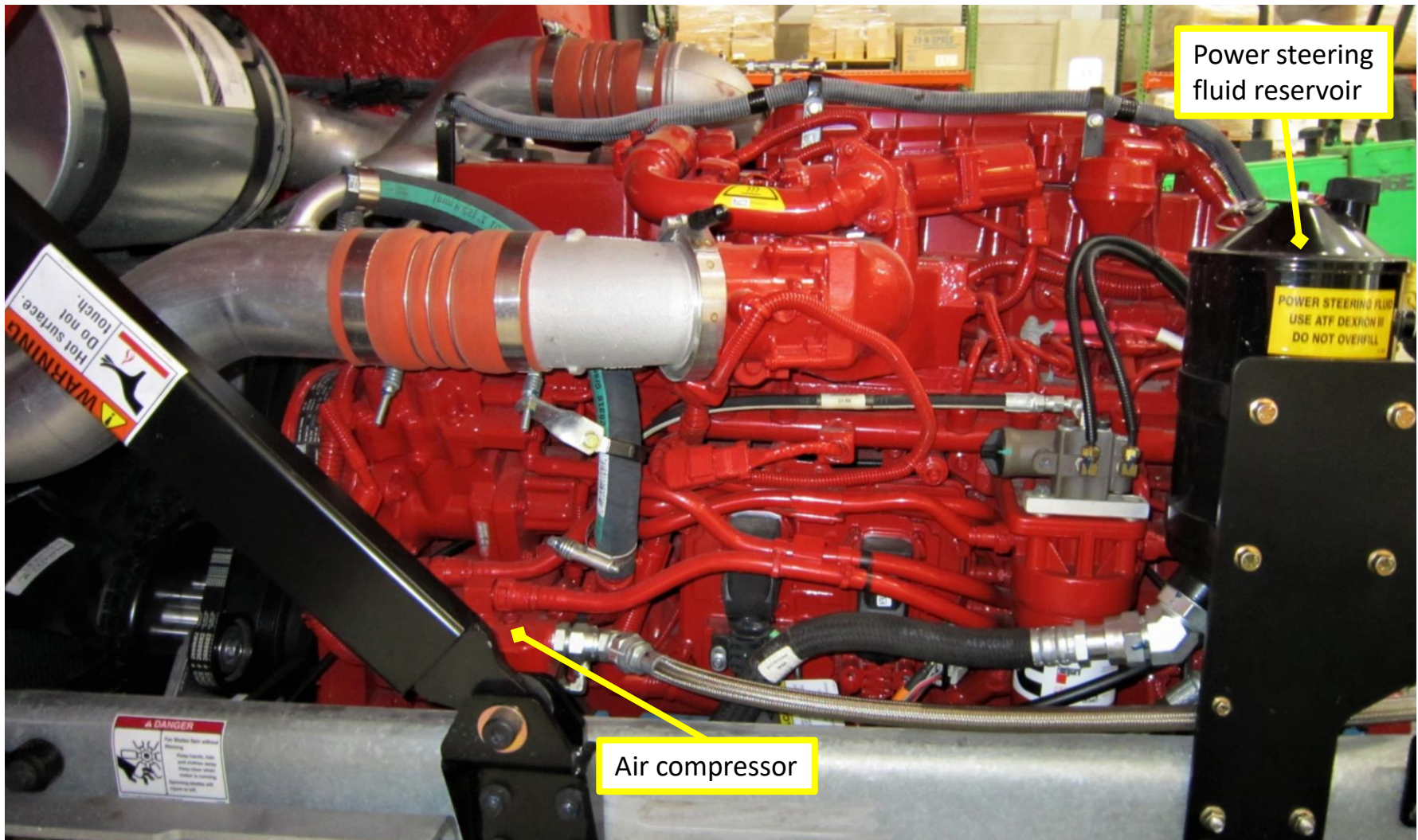


# Motor Compartment

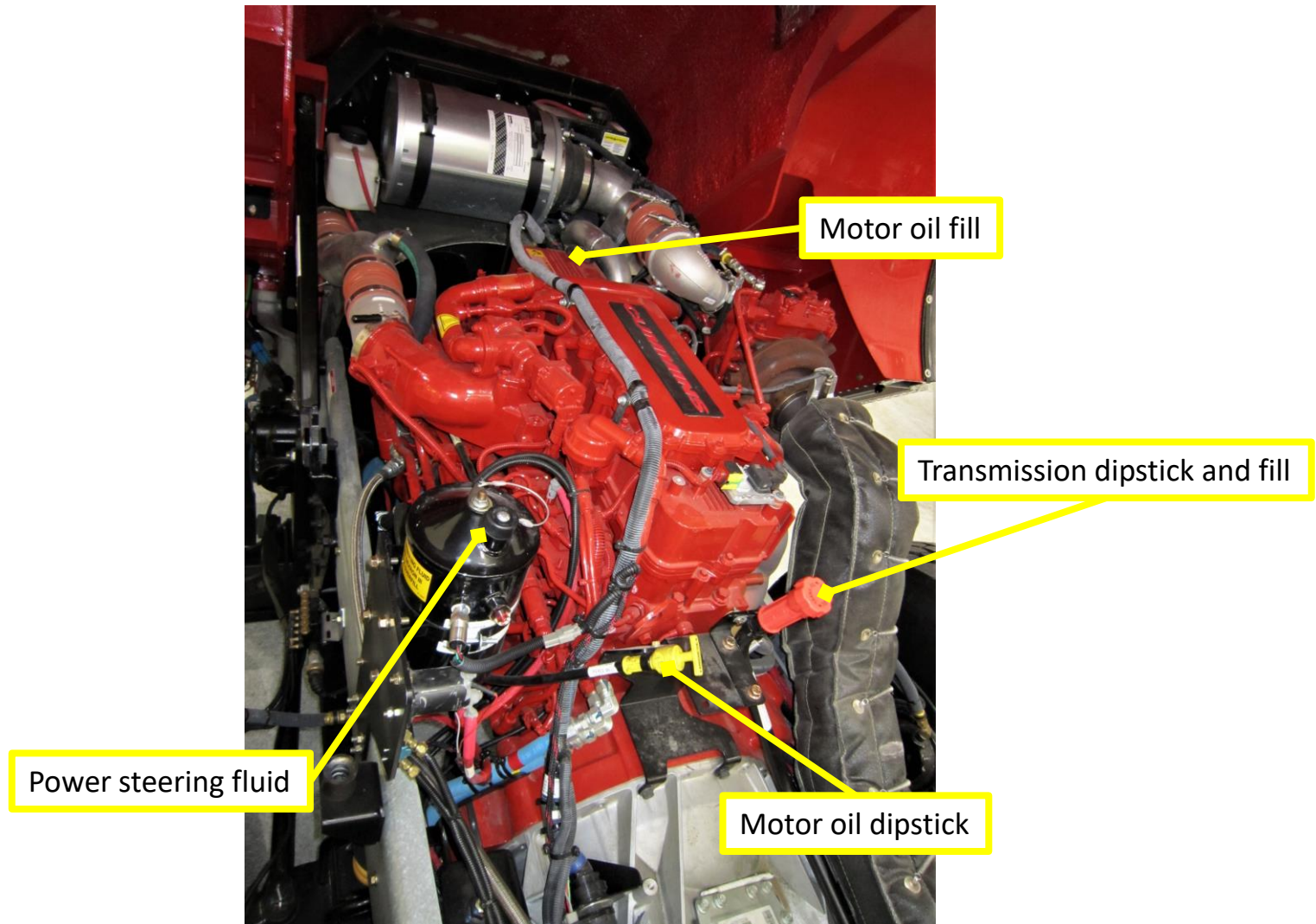




# Motor Compartment



# Motor Compartment





# Data Plate



- Located at the driver's seat side of the motor housing
- Always verify fluid type before adding

					
<b>Manufactured by: Pierce Manufacturing, Inc.</b> - Custom Designed and Manufactured Exclusively For - <b>MONTGOMERY COUNTY FIRE AND RESCUE</b>				Oshkosh Corporation VEHICLE EMISSION CONTROL INFORMATION Vehicle Family: KOSH2VOCV000 Sub-Category: Vocational Vehicles above 33,000 lbs GVWR Emissions component: LRRA THIS VEHICLE COMPLIES WITH U.S. EPA REGULATIONS FOR 2019 MODEL YEAR HEAVY-DUTY VEHICLES	
Mo./Yr of Mfg	May - 2019	Job No.	32064-08	WO No.	23150459
GVWR	21,319 KG ( 47,000 LB)	Tire-Limited Max Speed	68 mph	Chassis	Enforcer
GAWR		TIRES	RIMS	COLD TIRE INFLATION	
Front	9,072 KG ( 20,000 LB)	425/65R22.5 (L)	22.50x12.25	723 kPa ( 105 PSI)	SINGLE
Rear	12,247 KG ( 27,000 LB)	12R22.5 (H)	22.50x8.25	827 kPa ( 120 PSI)	DUAL
THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.					
VIN	4P1BAAFFXKA020400		TYPE	Emergency Vehicle	
CUSTOM HIGH GRADE PAINT FINISH					
Red	Pierce No.	307	Sikkens Autocast BTLY Basecoat	-	FLNA38253
None	Pierce No.	0	NA	-	NA
FLUID CAPACITIES Verify All Fluid Capacities and Perform All Maintenance Items outlined in the Chassis Operation Manual At The Recommended Time Intervals					
Component	Fluid Capacity		Fluid Type		
Engine	24.6 Liter	26.0 Quart	15W40 CK-4		
Trans	36.9 Liter	39.0 Quart	TES-286 Synthetic		
Coolant	31.2 Liter	33.0 Quart	OAT ELC		
Power Steering	3.8 Liter	4.0 Quart	TES 389 ATF		
Front Axle			75W90 SYN LUBE		
Rear Axle (#2 or Single)	21.8 Liter	23.0 Quart	75W90 SYN LUBE		
Rear Axle (#3)	0.0 Liter	0.0 Quart	75W90 SYN LUBE		
Cab Tilt	3.8 Liter	4.0 Quart	TES 389 ATF		
Gen	0.0 Liter	0.0 Quart	NA		
(Refer to Owners Manual for Temperature Ranges)					
Transfer Case	0.0 Liter	0.0 Quart	NA		
Equipment Rack - Per Reservoir	0.0 Liter	0.0 Quart	NA		
Breathing Air Compressor	0.0 Liter	0.0 Quart	NA		
CAPS Compressor	0.0 Liter	0.0 Quart	NA		
Water Pump Transmission	3.8 Liter	4.0 Quart	80W90		
Water Pump Primer	0.0 Liter	0.0 Quart	Not Required		
A/C Compressor	Refrigerant Charge	12.5 oz	Oil Type PAO 48		



# After-Engine Exhaust Treatment

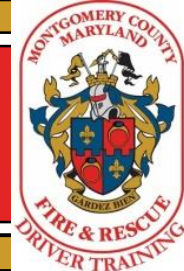









- Vehicle is equipped with diesel exhaust fluid and a diesel particulate filter

See [Cummins After-Engine Treatment Brochure](#) for more info.



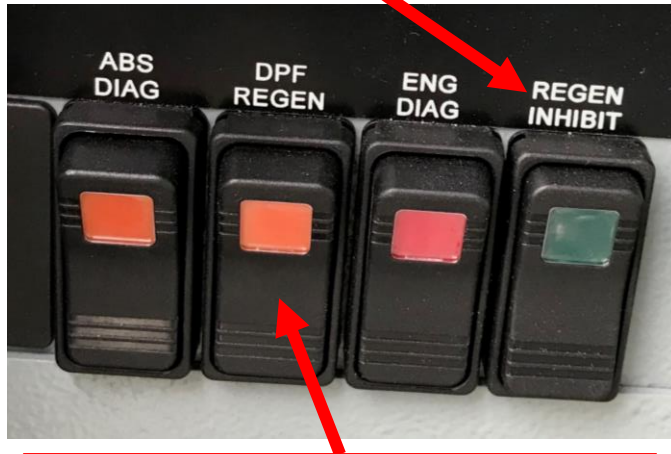
# Regeneration Indicators



	The Diesel Particulate Filter (DPF) light will illuminate when a regeneration is necessary. There are progressive stages of need for regeneration indicated by this light:
 ON SOLID	1. On solid (low to medium levels of particulate build up). The vehicle requires regeneration but should be able to complete its mission before a regeneration is performed. <ul style="list-style-type: none"> <li>— Ensure the Regen Inhibit Switch is not activated.</li> <li>— Initiate a DPF regeneration by switching to a more challenging duty cycle (such as highway driving for at least 20 minutes or pumping)</li> <li>— OR perform a parked regeneration.</li> </ul>
 FLASHING	2. Flashing (medium to high levels of particulate build up). The vehicle requires a regeneration as soon as possible). <ul style="list-style-type: none"> <li>— Perform a regeneration by switching to a more challenging duty cycle or a parked regeneration.</li> </ul>
 FLASHING  CHECK ENGINE	3. Flashing with amber Check Engine light (high level of particulate build up). A DPF regeneration is required immediately. <ul style="list-style-type: none"> <li>— An automatic regeneration will not initiate. The operator must perform a parked regeneration.</li> </ul>
 FLASHING  CHECK ENGINE  STOP ENGINE	4. If a parked regeneration is not performed the red Stop Engine lamp will illuminate. <ul style="list-style-type: none"> <li>— As soon as it is safe to do so, the vehicle should be <b>stopped</b> and remain shut down until serviced by an authorized dealer.</li> </ul>

# Active Regeneration

Prevents system from entering or continuing in active regeneration mode; used when regen may engage in an undesirable location

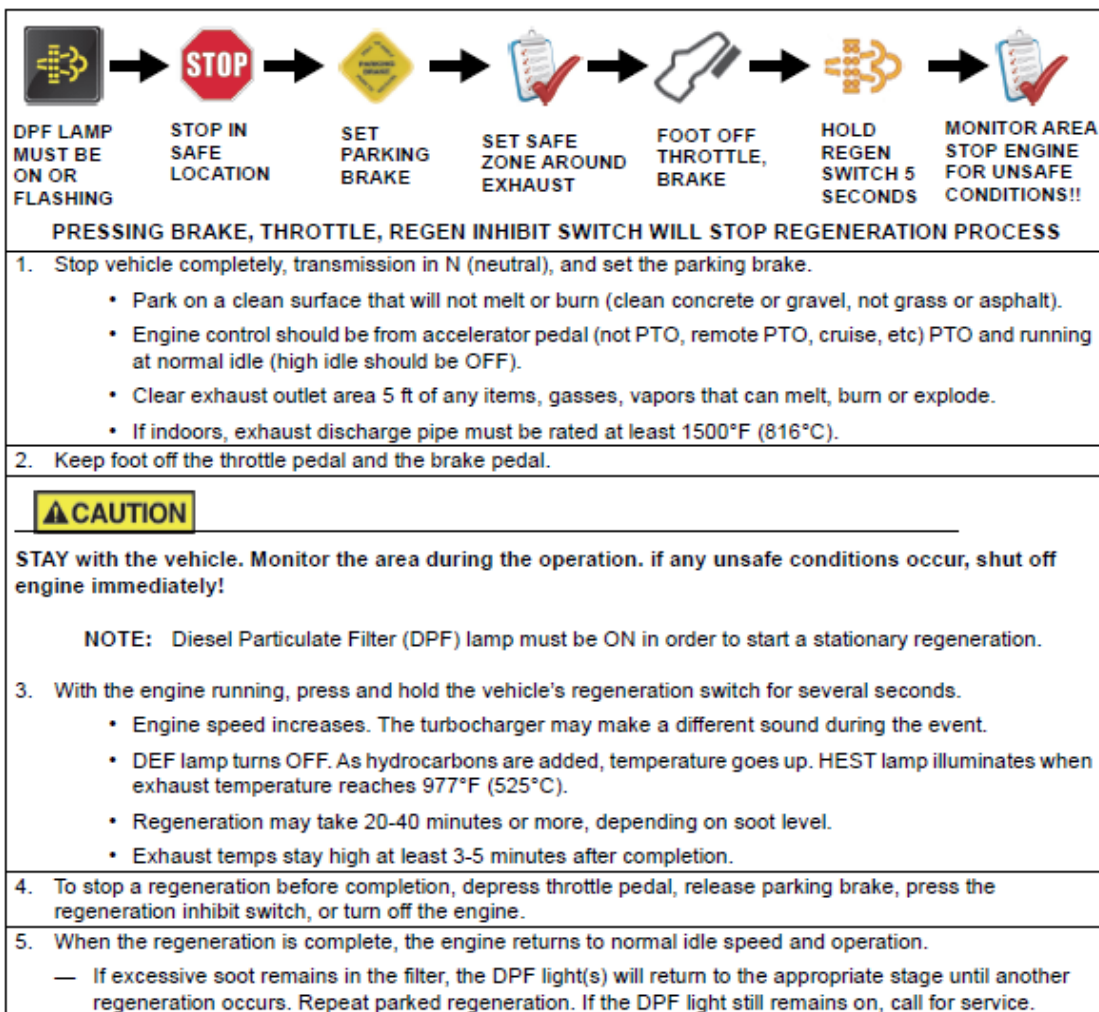


Used to manually initiate a parked regeneration; DPF lamp must be illuminated to engage

- Due to the type of travel typical of fire apparatus “active regeneration” is most common
- Active regeneration occurs:
  - a. When an intervention by the operator during travel or pumping operations creates correct conditions for regen
    - Requires sufficient exhaust flow and temperatures
    - Speedometer >5mph
    - NO engine speed variations will occur when pumping or driving
  - b. Manually by activating the DPF Regen switch while parked

**Regeneration will not effect motor RPM during pumping operations if it engages automatically.**

# Parked Regeneration



**Do not perform regen inside a building or while attached to an exhaust removal system!**

**A minimum of 5 feet of clearance is required to the exhaust outlet.**

**When pumping it may be necessary to inhibit regen if clearances to the exhaust are not available!**

For additional information, refer to the [Pierce Saber/Enforcer Operator's Manual](#).



# Fuel & DEF



- Diesel Fuel
  - Fills on both sides of the apparatus at the rear wheel well
  - 65 gallon capacity
- Diesel Exhaust Fluid (DEF)
  - Fluid level displayed on dashboard gauge panel and in Command Zone display
  - 4.5 gallon tank
  - Fill on driver's side co-located with diesel fuel fill
  - Light blue cap
  - Must open spring-loaded door to access



*Officer side fill – diesel only*

**The diesel fuel caps are silver and require opening one door.  
The DEF cap is blue and requires opening two doors.**

# DEF Access – 2 steps



1. Open the fuel fill access on the driver's side



2. Pull down the spring-loaded cover to access the DEF tank cap

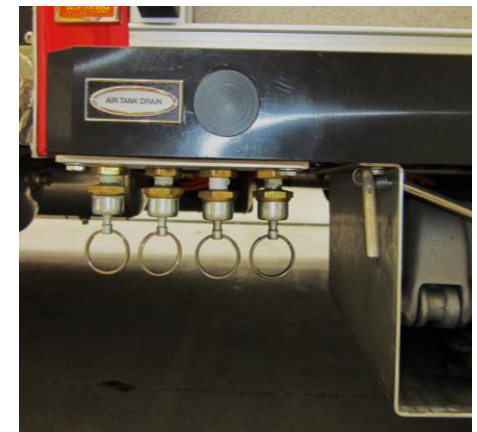


*Driver side fill – diesel and DEF*

# Suspension & Brake Systems



- 20,000lb front axle
  - Not TAK4
- 27,000lb rear axle
- Parking brake
  - Locks up all wheels
  - 2<sup>nd</sup> actuator located on officer's side dashboard adjacent to A-post for emergencies
- Anti-lock disc air brakes front and rear axle
- 18.7cfm air compressor
- 12v auxiliary air compressor behind driver seat
  - Powered by shoreline to maintain brake system while parked
- Heated air dryer on wet tank
- Stainless steel air storage tanks
- Air tank drain actuators – driver side beside wheel chock mount



# Brakes



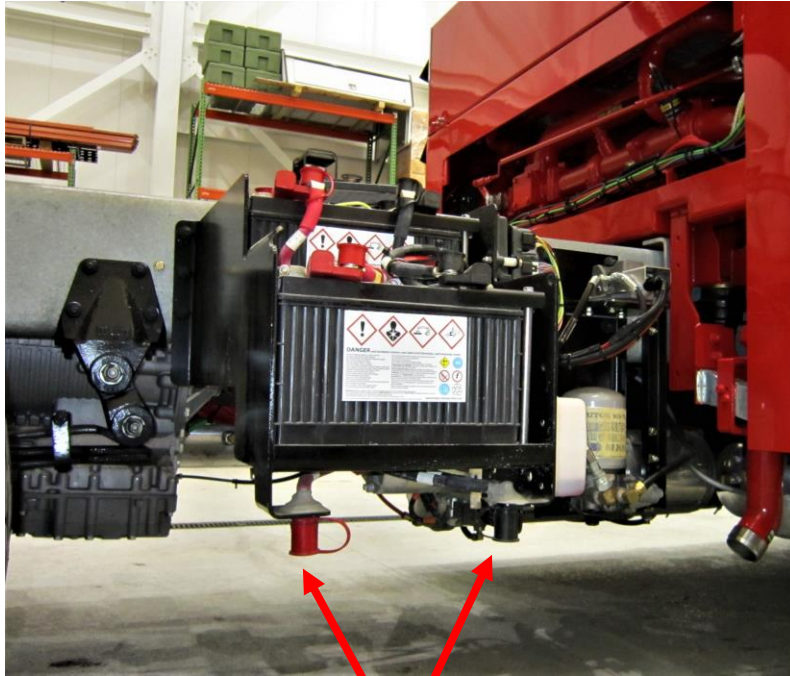
*Front Brake Pad Wear Indicator*



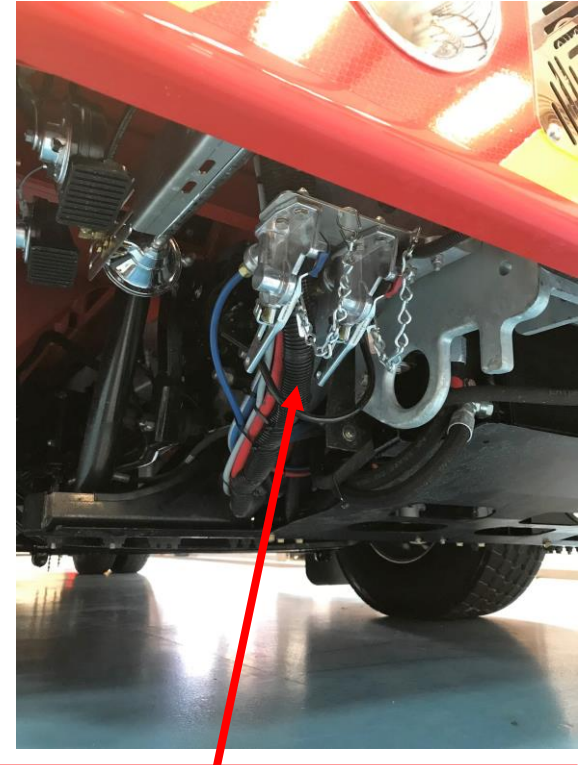
*Rear Brake Pad Wear Indicator.*



# Jumper Studs & Glad Hands



Jumper studs accessible below driver's side cab door when cab is nested



Glad hands located below the front bumper to assist with towing

# Snow Chains



- OnSpot automatic snow chains on rear axle
- Switch located on dashboard to the left of the steering wheel



# ONSPOT



# Shoreline

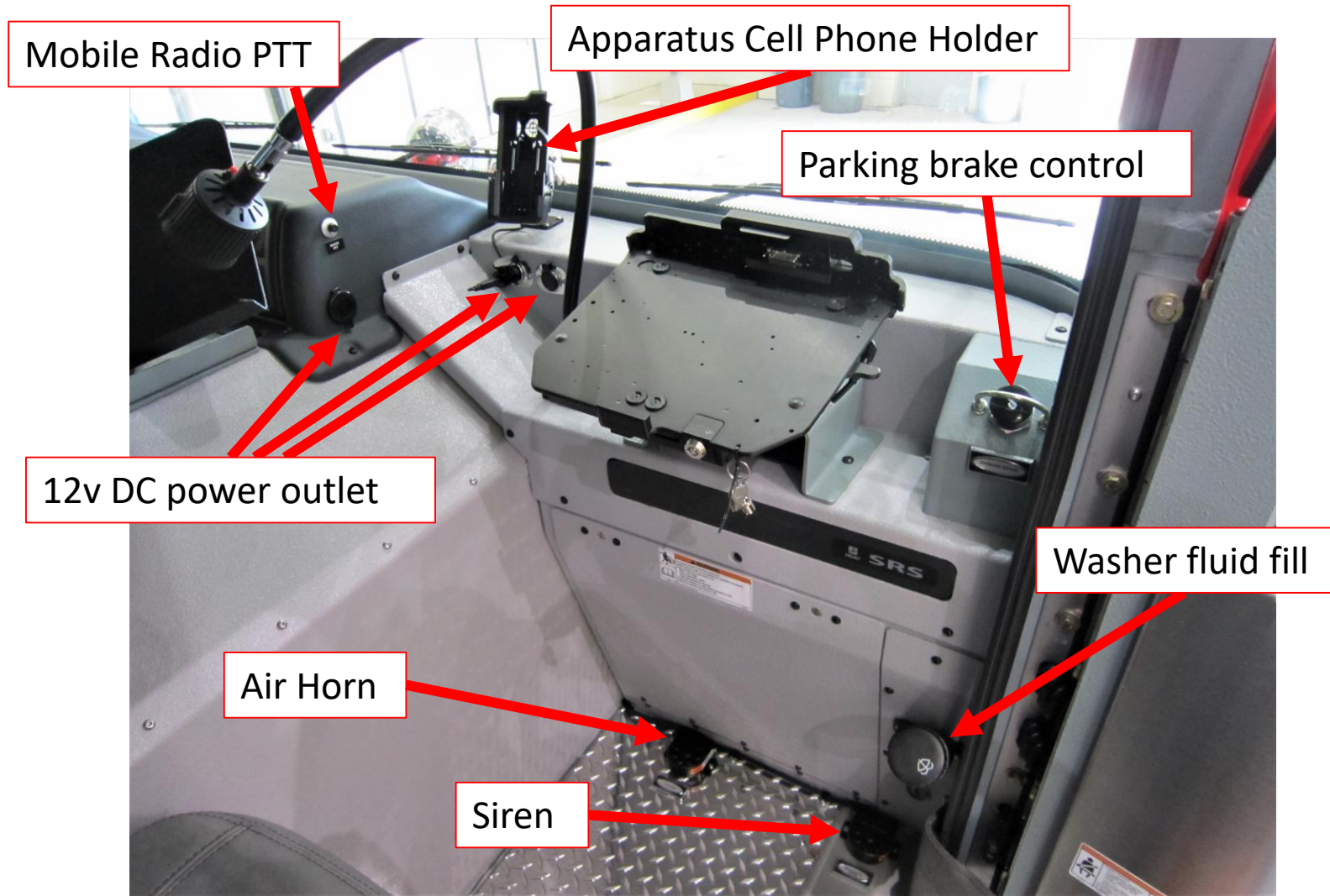


**This is not an auto-eject plug.  
Must be unplugged manually before  
closing the cab door.**

- 20 amp, 120v NEMA 5-20 plug with green indicator light
- Driver's door must remain open when shoreline is connected
- Supplies IOTA DSL55 55 amp battery conditioner and auxiliary air compressor



# Officer Seat Area



# Officer Seat Area



Convenience hook for officer seat belt



Scene lights

Rear siren speaker on/off

Apparatus speed



**Electronic siren has a rear facing speaker. Officer controls the on/off. Intent is for notification during merging situations on limited access roadways.**





# Dashboard Display





# Driver's Seat



Forward/aft adjustment

Air controlled height adjustment

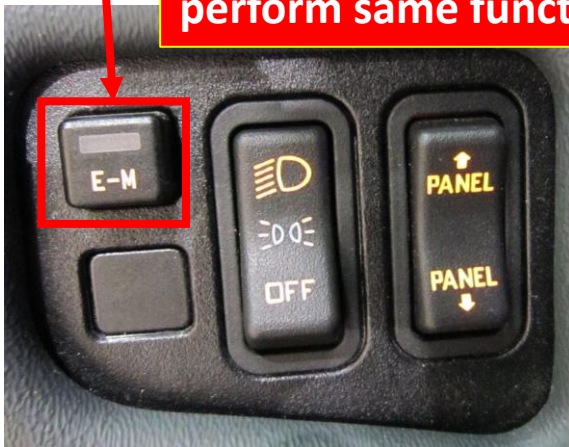


# Warning Light Controls



*Warning light switch panel*

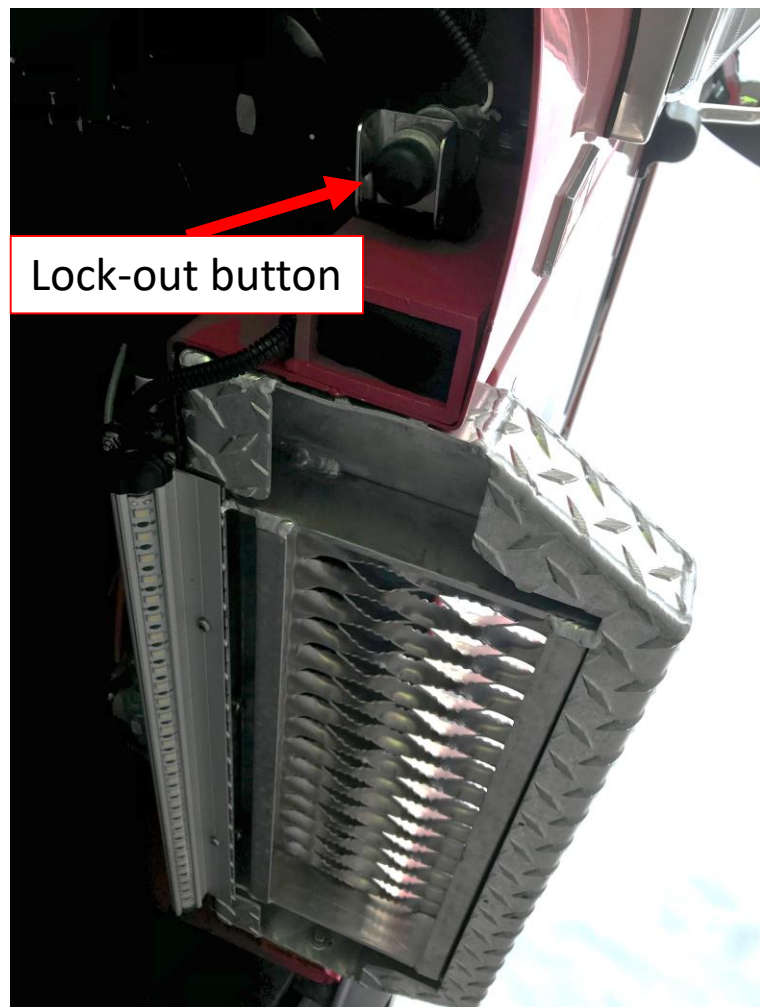
**E-master switch on the overhead panel and on the dashboard perform same function**



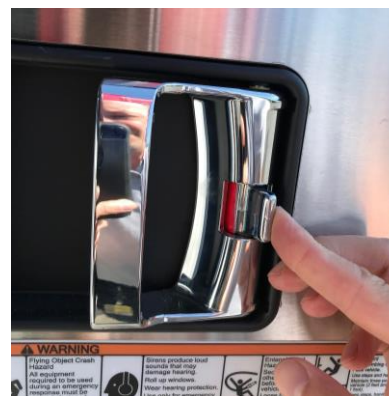
*Scene light switch panel*

Allows operator to control clear warning lights manually. Resets to default setting when E-master is cycled.  
Useful when clear lights are blinding during fog or snow.

# Cab Door Locks



- Electric door locks on cab entry doors
  - Not connected to compartments
- Lock-out switch located below the cab by the driver's door entry step
- **Driver and officer doors control all four cab doors**
- E3 and E4 doors only control the individual doors





# Starting & Stopping the Motor



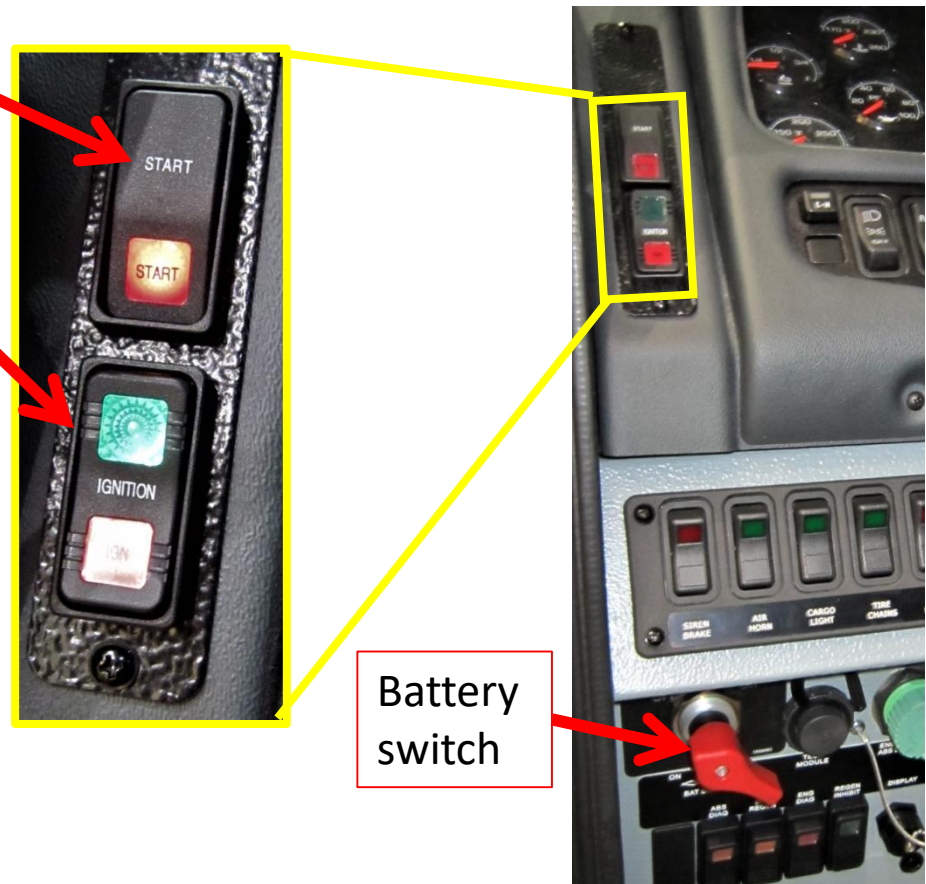
- Battery switch, ignition switch, and start button are all grouped near the A-post on the driver's side

Press to start the motor.  
Engage for no more than 15 seconds.

Ignition switch  
-up to run/on  
-down to shut off

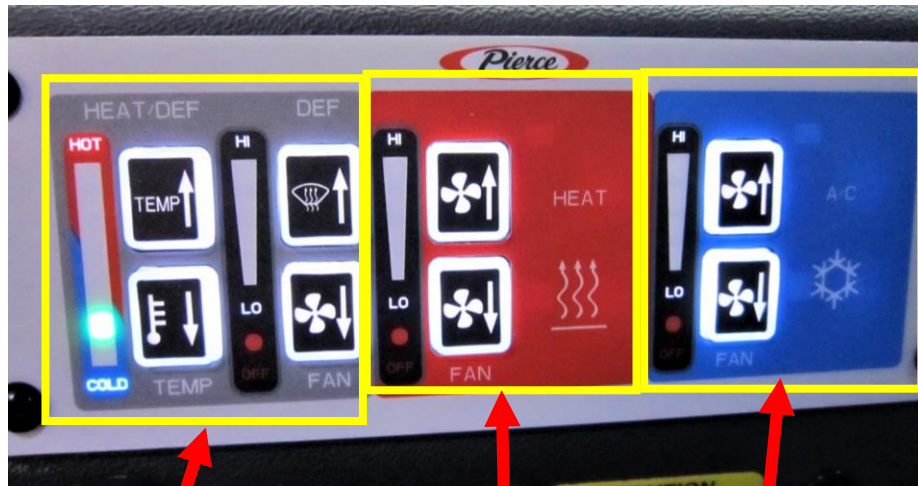
**Allow gauges to complete their sweep before attempting to start the motor. Failure to wait can result in false sensor alarms.**

**In addition to the battery, ignition switch must be "on" for most electrical functions to work (like cab tilt)**



Battery  
switch

# HVAC, High Idle, Pump Shift

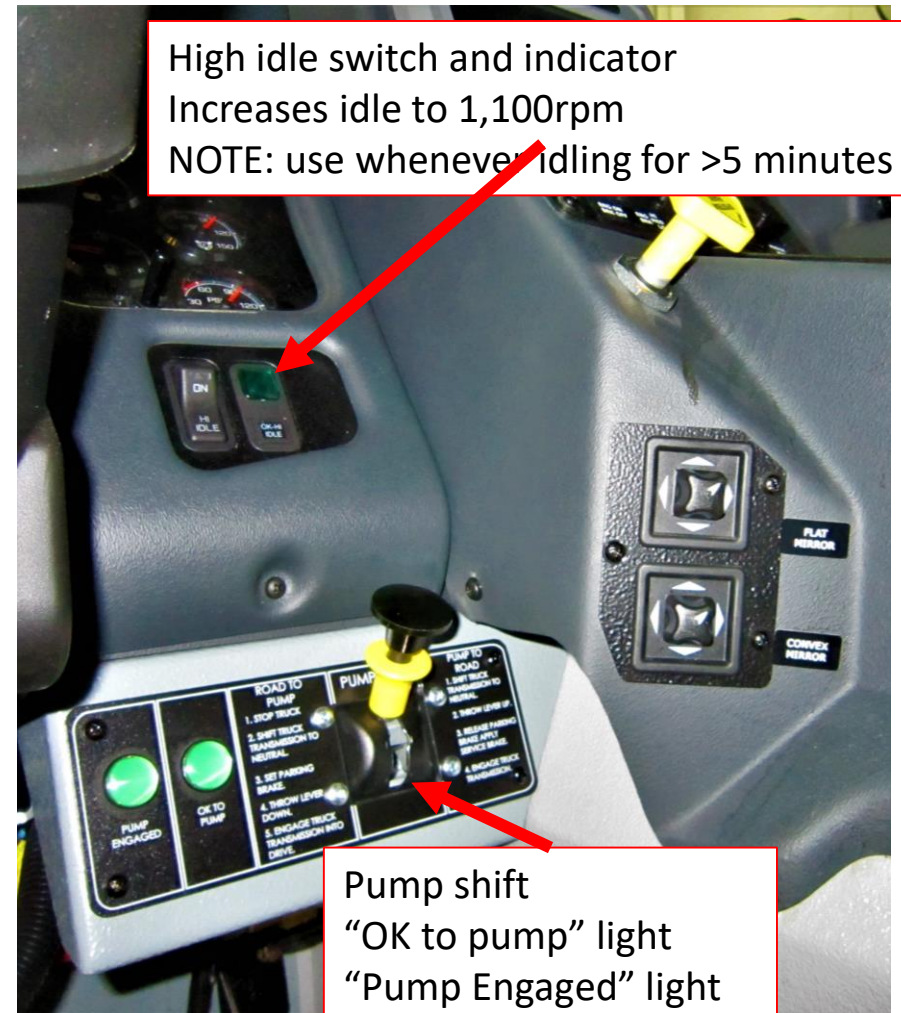


Defroster

Heat

Air  
Conditioner

Defroster requires air from the intakes on the face of the dashboard; keep it clear of obstructions.



High idle switch and indicator  
Increases idle to 1,100rpm  
NOTE: use whenever idling for >5 minutes

Pump shift  
"OK to pump" light  
"Pump Engaged" light



# Jake Brake, ATC, Mirror Heat

- Engine (Jake) Brake
- Auto Lube Fault Indicator
- Off-Road Traction
- Low Power Steering Fluid Indicator
- Mirror Heat



Momentarily impairs ATC to allow more wheel spin; may be desirable in extra soft surfaces like snow, gravel, or mud (similar to Mud/Snow on Crimsons)

**Pierce recommendation: When road conditions dictate that a driver change his/her driving pattern, the driver should disable auxiliary braking systems (Engine Brake).**



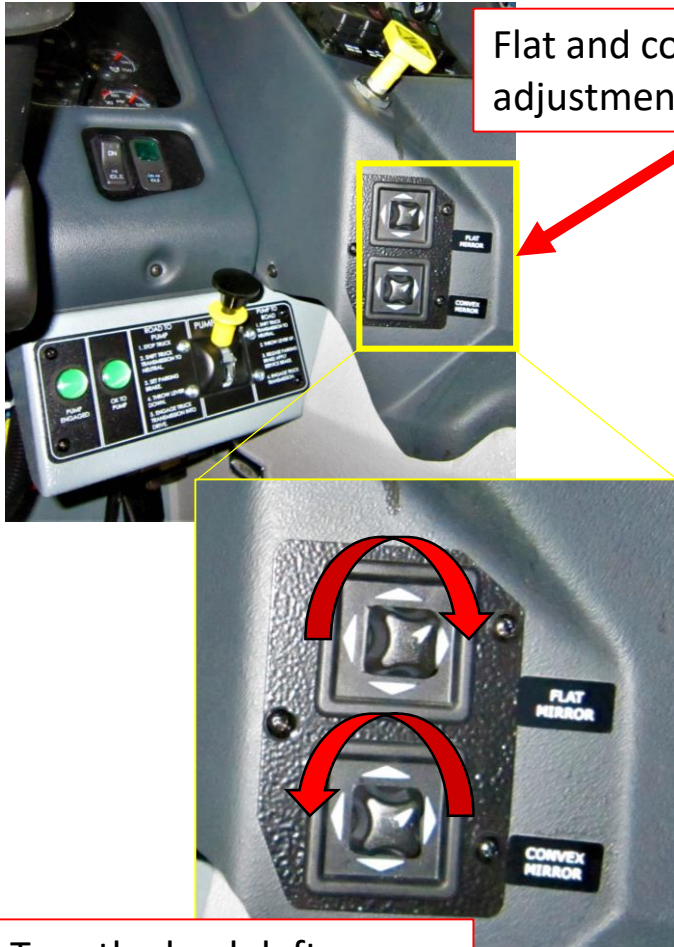
12v DC power outlet



# Mirror and Wiper Controls



Flat and convex mirror adjustment controls



Turn the knob left or right to select the mirror

Windshield wiper control



Wipers are programmed to stop operating when parking brake is engaged; saves the wiper blades

# Siren Brake, Headlights, E-Master

Emergency Master



Headlights/DOT Lights

Panel light dimmer



Electric/Air Horn in steering wheel hub

Controls work light above crosslays

Used to prime system if fuel runs out or following maintenance; not used under normal conditions

Shows when load sequencer is engaged; no operator intervention should be needed

# Command Zone Display



- Command Zone III system located on the dashboard to the right of the steering wheel
- Functions are a mix of hard buttons and touch screen
  - ✓ Vehicle systems monitoring
  - ✓ Vehicle systems controls
  - ✓ Vehicle diagnostics

## Home Screen

Fuel, DEF, Speed, Seat Belt Status



Go to the Driver Training website for additional [Command Zone III](#) information.



# Command Zone – Fire Function



## Fire Functions & Vehicle Status

Fuel, DEF, Oil, Voltage, Water Temp,  
Transmission Temp

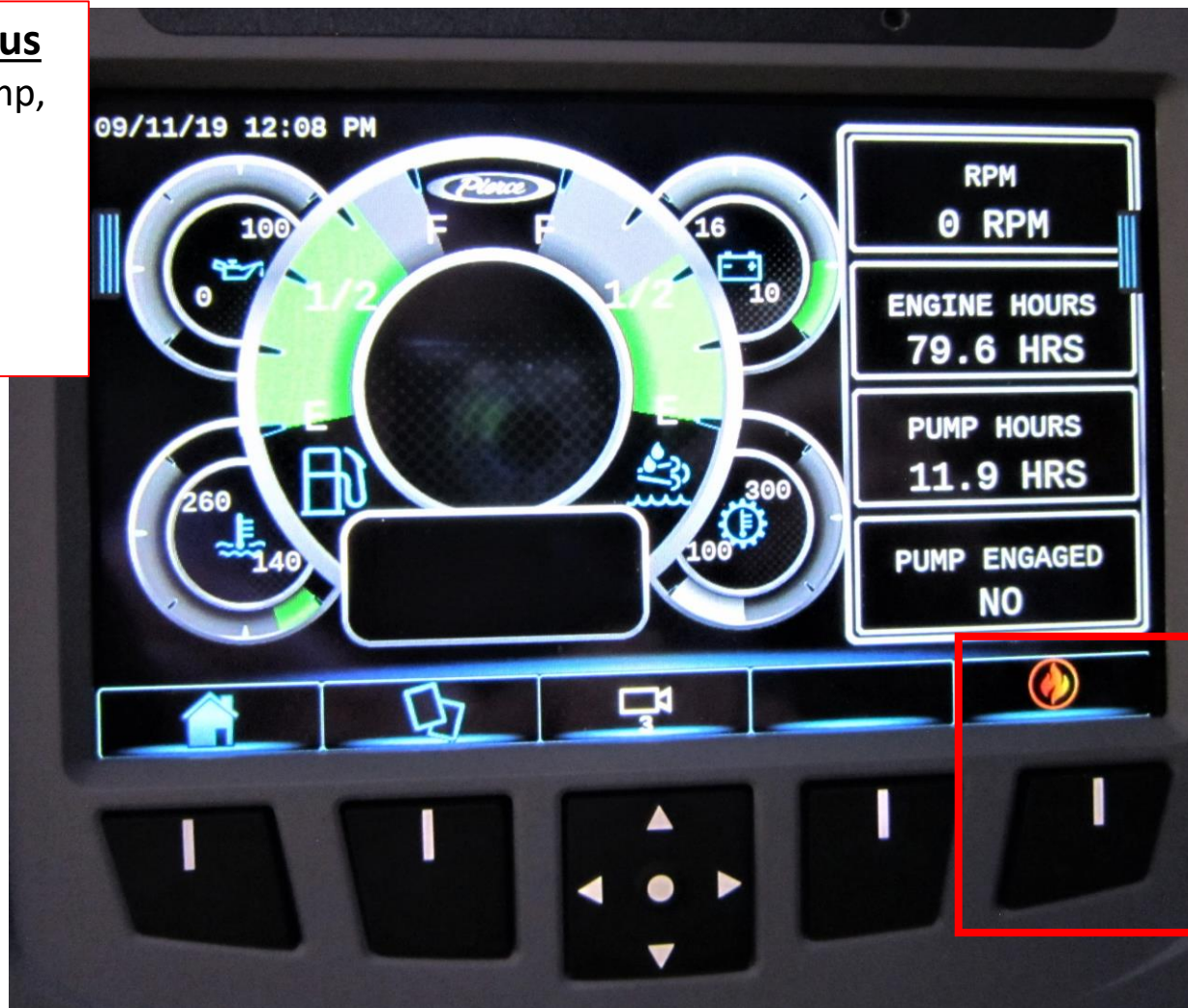
Engine RPM

Engine Hours

Pump Hours

Pump Status

Default screen when  
pump shift occurs



# Command Zone - Menu



## Menu Screen

Use arrow keys to select function status to be displayed.





# Command Zone - Notifications

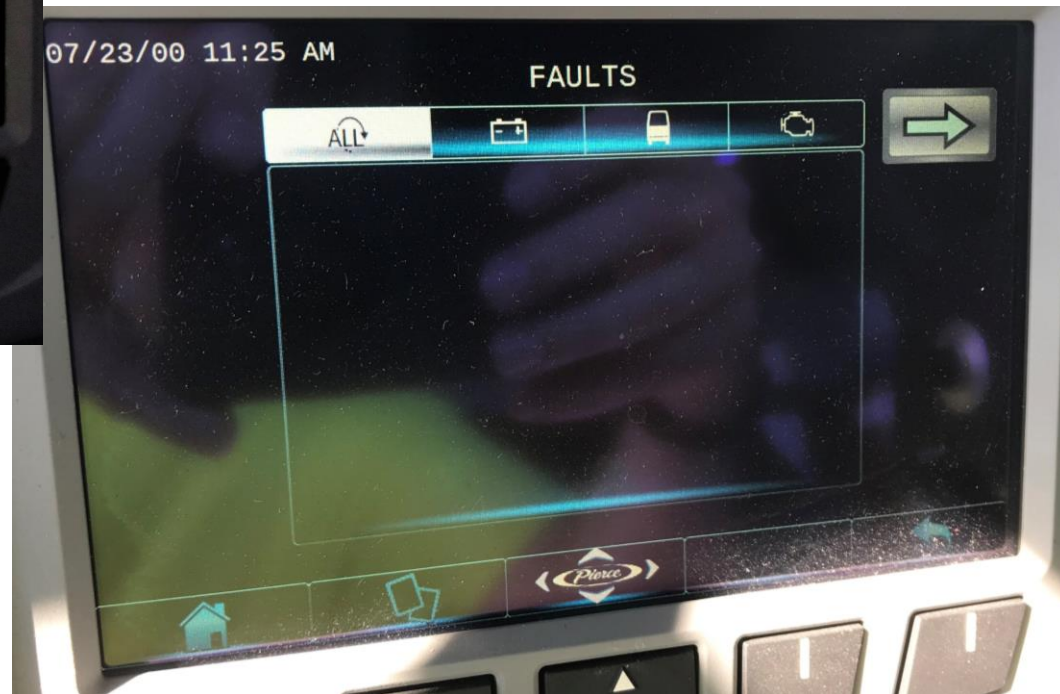


## Notifications

Accessible from Menu screen



**Serious faults or messages will also appear as general notifications on the Home screen**





# Command Zone - HVAC



## HVAC

Accessible from Menu screen  
Same controls as the dashboard

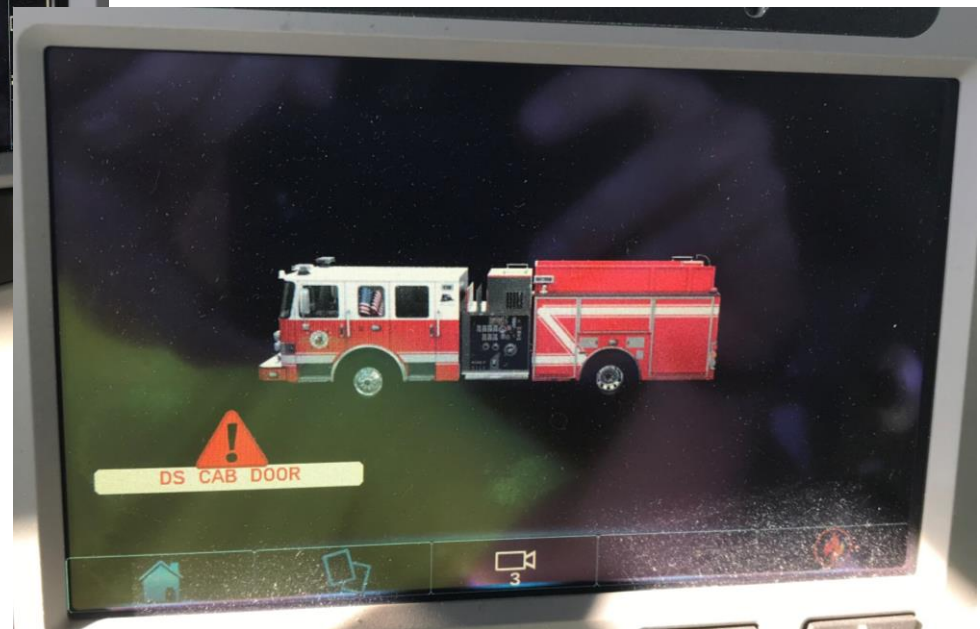


# Command Zone – Do Not Move



## Do Not Move Truck

Accessible from Menu screen.  
Enables specific identification of  
open doors or other warnings.



# Command Zone - Timer



## Timer

Accessible from Menu screen





# Command Zone - Diagnostics



## Diagnostics

Accessible from Menu screen  
Shows the status of various systems on the vehicle.



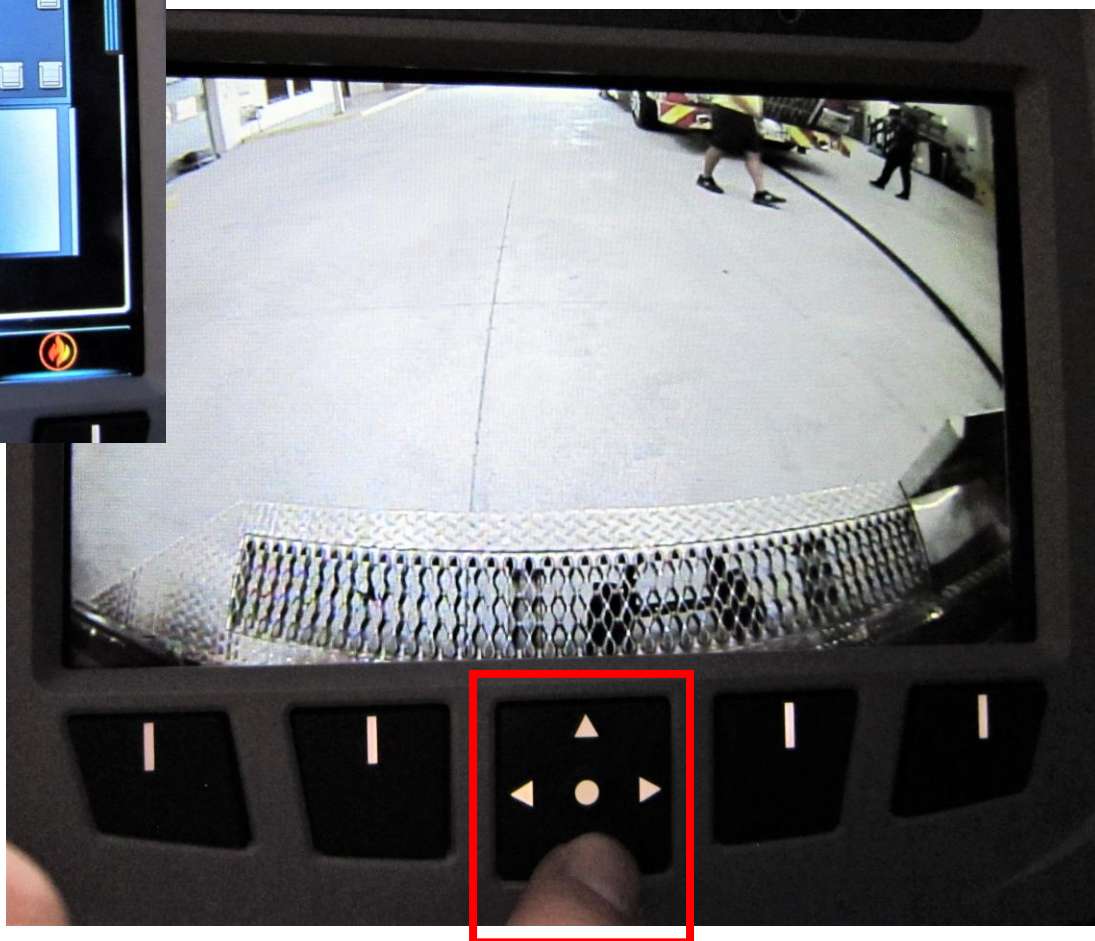
# Command Zone - Camera



## Rear Camera Screen

Press down arrow to display when transmission is not in Reverse.  
Press up arrow to turn off.

Defaults to this screen automatically when transmission is in Reverse





# Rear Camera

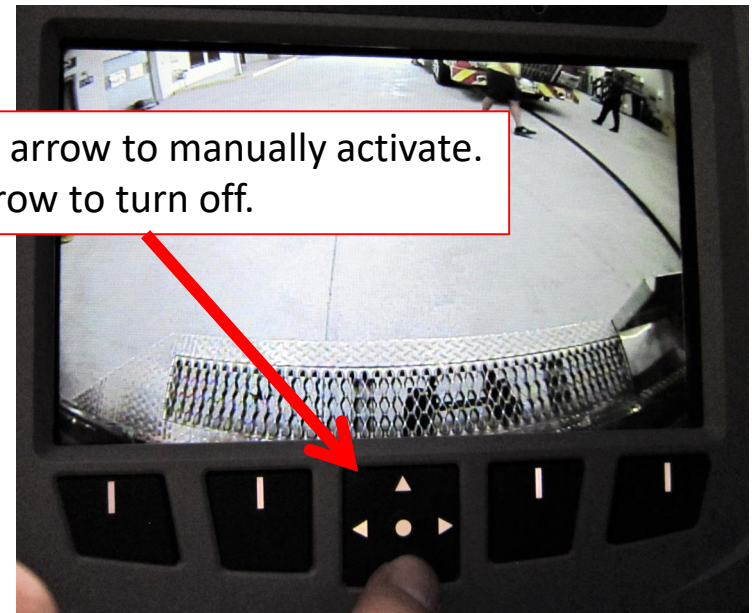


- Located above the rear compartment; displayed in command zone screen on dashboard
- Automatically engages with transmission in “reverse”
- Manually engages using buttons at the display screen



Note: net blocks the camera when rear hosebed is deployed

Press down arrow to manually activate.  
Press up arrow to turn off.





# SCBA Brackets – SmartDock



- No straps or levers to restrain the SCBA or to release the SCBA - blue latching mechanism holds the SCBA in place during transit.
- In the event of a collision, inertial forces cause the top latching mechanism to lock the SCBA in place, preventing it from becoming a projectile.
- **To release the SCBA, a smooth motion is required. Slow is smooth; smooth is fast.**
- With the SCBA straps donned, the wear should bend forward at the waist and stand up to release the tank from the upper claw.
- If the tank is too loose or too tight within the claw there is an adjustment knob on top of the bracket.



For additional information view a quick video at

<https://www.youtube.com/watch?v=y43vJK3bsVo&app=desktop> or check out the manufacturer's website at <https://www.imminet.com/products/fire-ems/smartdock/>

# SCBA Strap Retainers



- Each SCBA-equipped seat has loops to stow SCBA straps
  - Enhances donning while seated
  - Secured by magnets (look like buttons)



# Suppression Features



- Hale 1500gpm single stage Qmax pump
- Hale Total Pressure Master (TPM) system
- Trident air primer
- Class 1 SmartFOAM proportioner with FoamLogix 6.5 pump
- 750 gallon water tank
- 50 gallon class A foam tank

**No CAFS**

**No integral Class B foam tank**

**No Autofill**



# Pump Shift & Engagement



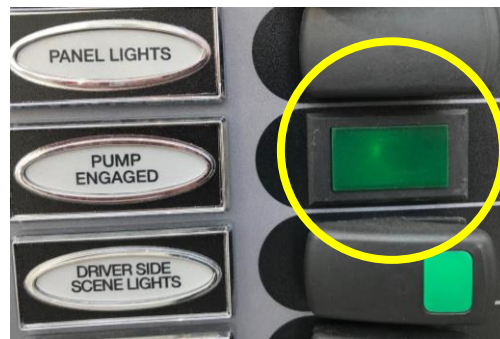
## In-cab signs of successful pump shift

- ✓ Indicator lights beside shift lever
- ✓ Command Zone screen
- ✓ Speedometer rises
  - Note: accelerator remains active even in pump gear



## Pump panel signs of successful pump shift

- ✓ Pump Engaged light illuminated
- ✓ 3<sup>rd</sup> panel light illuminated (see next page)
- ✓ Pressure rise on main discharge gauge (assuming a wet pump)
- ✓ Auto light lit on pump primer (assuming AUTO mode)

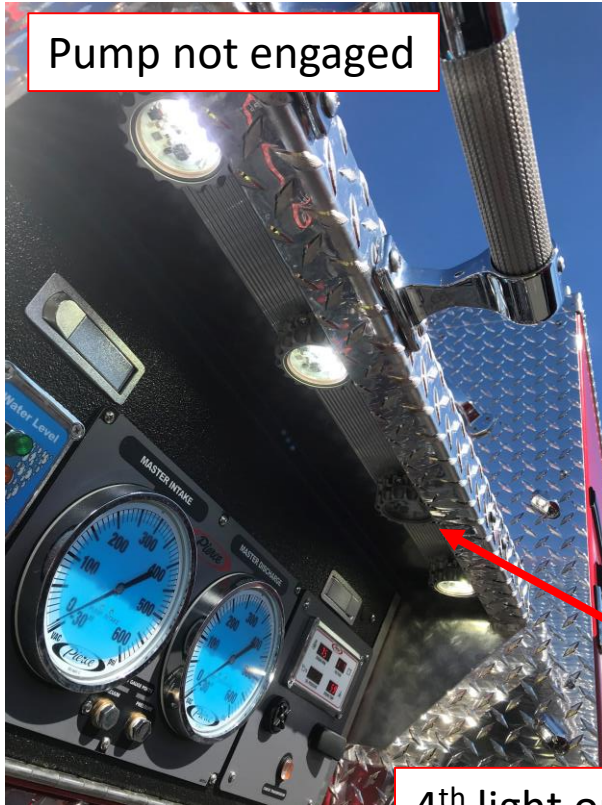


**There is no manual override for the pump shift.**

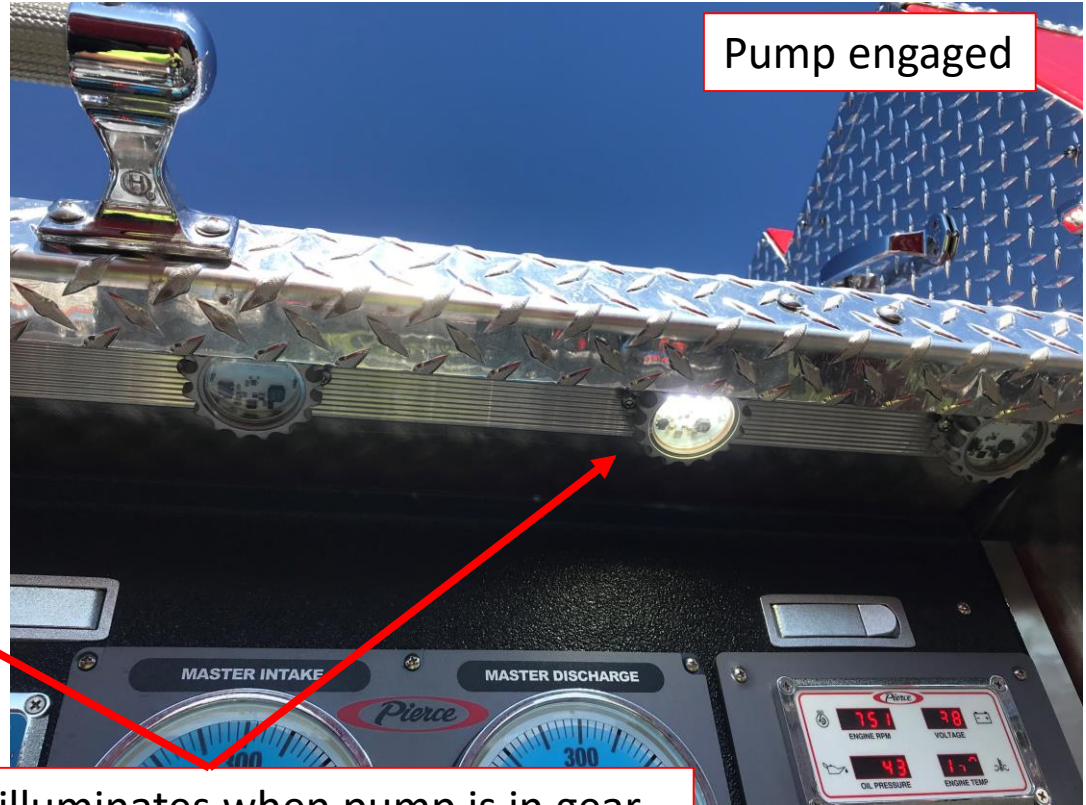
# Pump Panel – Driver Side



Pump not engaged



Pump engaged



4<sup>th</sup> light only illuminates when pump is in gear



# Pump Panel – Driver Side



- Rear Discharges
- Deck gun
- Foam controller
- Throttle
- TRV





# Pump Panel – Driver Side



- Motor diagnostics
- Alarm silence



# Pump Panel – Driver Side



- Crosslays
- Drivers Side Discharge 1
- Booster Reel





# Pump Panel – Driver Side

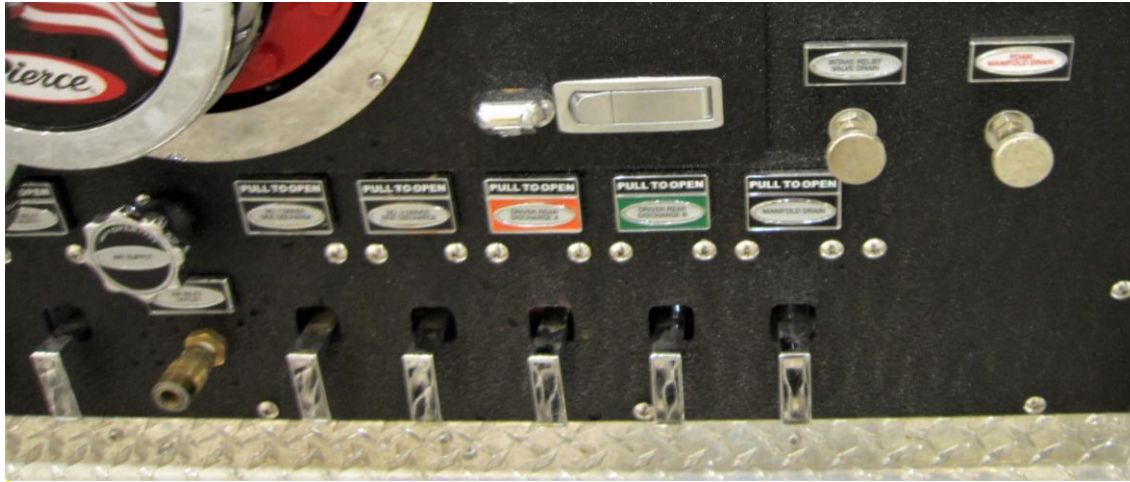


- Intake controls
- Intake primers
- Intake bleeders





# Pump Panel – Driver Side



- Discharge drains
- Air outlet and valve
- Intake relief valve drain
- Foam manifold drain



# Pump Panel – Driver Side



- Large Diameter Discharge Controls

Unlike the Crimson, there is no integral pressure relief valve on these discharges.





# Pump Panel – Driver Side



- Switch panel
  - Booster reel rewind
  - Panel lights
  - Pump Engaged indicator
  - Scene lights





# Pump Panel – Driver Side



- Driver side intake
- MIV override



# Pump Panel – Driver Side



- Hale Total Pressure Master
- Throttle control
- Hale Thermal Relief Valve

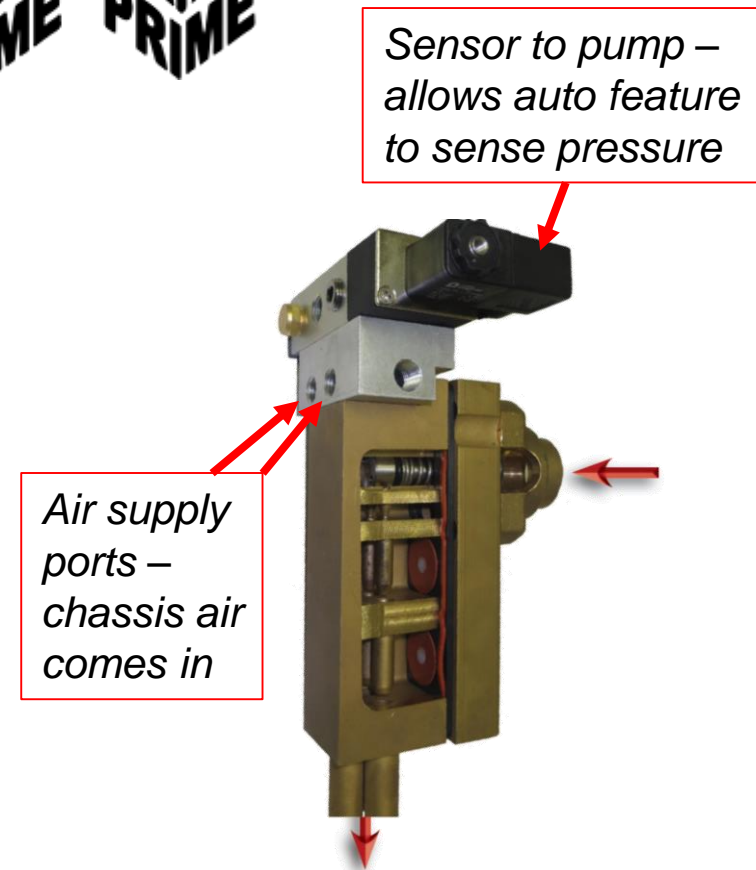


# Pump Primer



## Trident Air Primer

- Utilizes air supplied by the chassis air brake system to operate the pump primer
  - Up to 15.6 cubic feet per minute
- Very low impact on vehicle electrical system - 0.4 amps
- 27' vertical lift capable
- Two types of controls
  - Manual
  - Automatic





# Pump Primer



- No internal motor, solenoid, or cables
- Brass and steel construction
- Primer design provides automatic draining to avoid freezing
- No lubrication necessary
- No limitation on primer engagement time
  - Only limitation is avoiding running a dry pump in gear



Primer located behind curbside pump panel

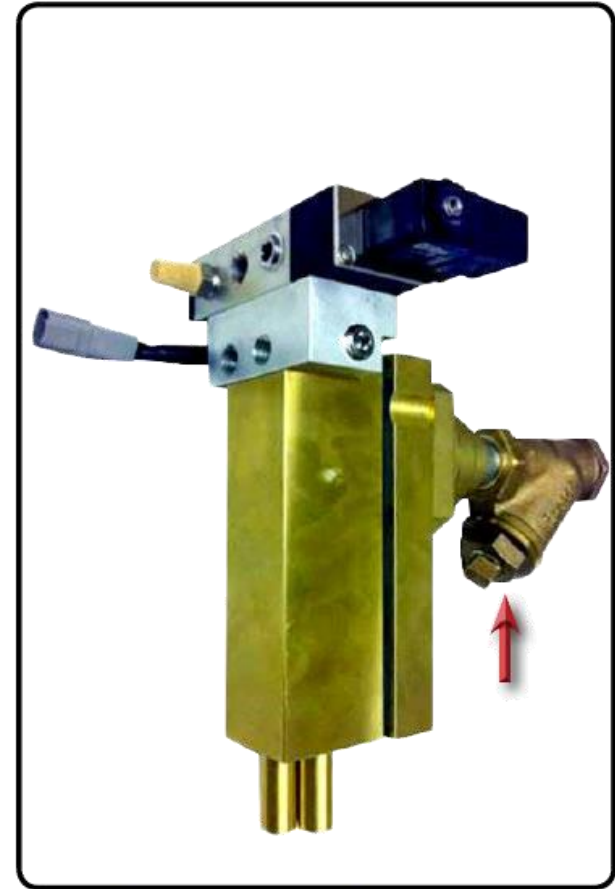
# Pump Primer



- No maintenance requirements for operations personnel
- If priming becomes noticeably slow or weak, personnel may check the integral strainer for debris



Separate and Cleanable  
Wye Strainer

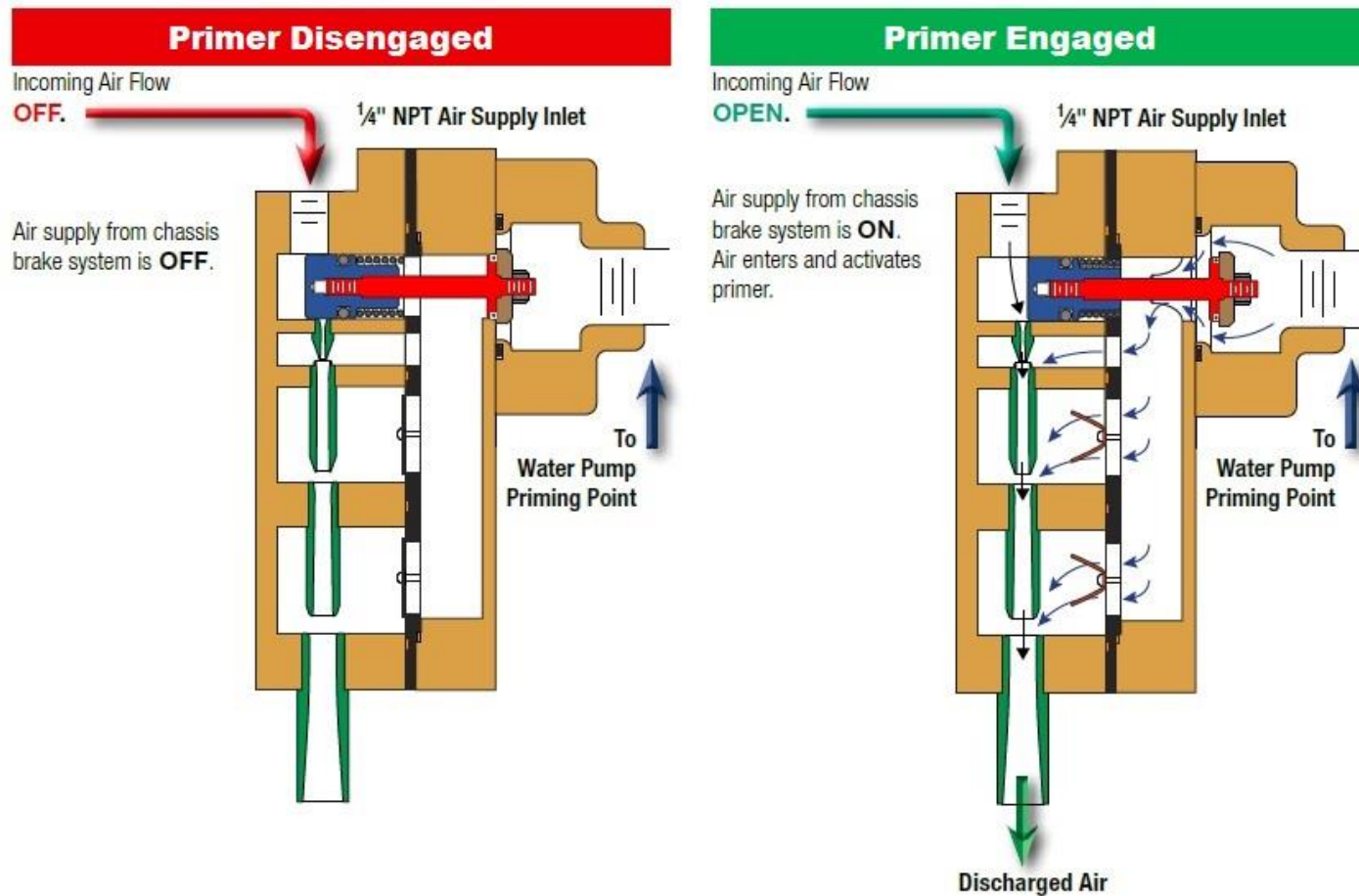


Integral Strainer on Primer Intake  
Shown With Red Arrow Above

# Pump Primer



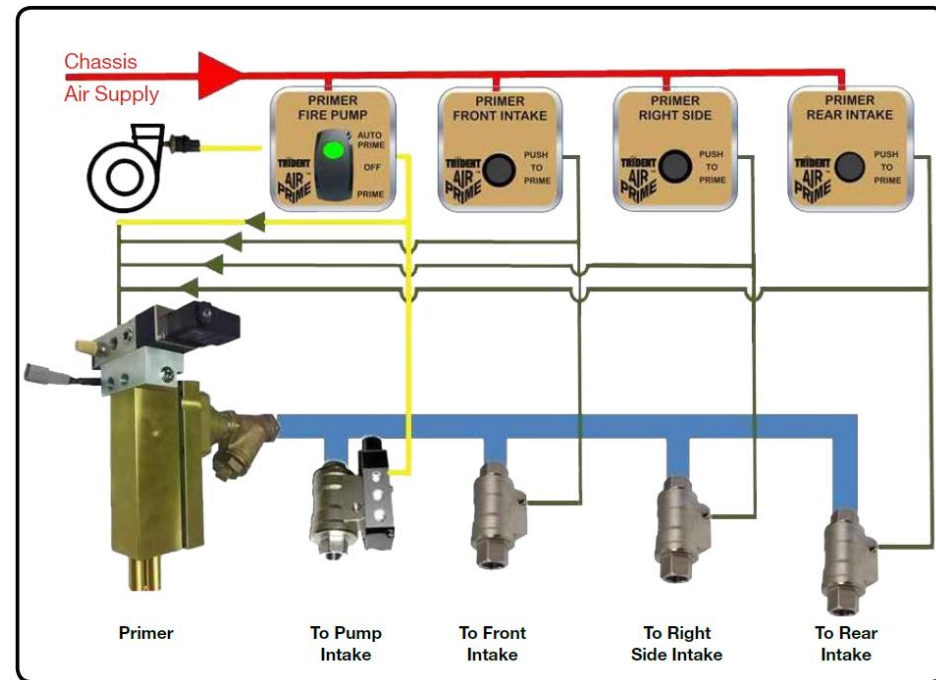
## Internal Operating Mechanism





# Pump Primer – Main Pump

- Auto Primer engages when pump pressure measured near the impeller drops below 20psi
  - Air slug
  - Discharge opens too fast
  - Switching from tank water to another source
- Manual intake primers can be simultaneously engaged with the Auto Primer



*Combination Auto/Manual system*  
✓ Auto for the main pump  
✓ Manual for the individual intakes

# Pump Primer – Main Pump



- Primer for the main pump is automatically activated when:
  - ✓ Pump is in gear – “OK to PUMP”
  - ✓ Pump pressure is <20psi; and
  - ✓ Auto Prime is engaged (light is lit)
- Auto Primer can also be disengaged and used manually
  - Depress the control switch downward toward the “PRIME” label
  - Useful for periodic testing of the primer
  - Not normally the desirable mode of operation
- Generally leave the switch set to AUTO



# Pump Primer - Intakes



- Operator manually depresses the PUSH TO PRIME button for the desired intake
- Configured to prime the individual intakes
  - Augments main pump primer
  - Located outboard of the MIV
  - Replaces the selector valve on the Crimson engines
- Used in a combination Automatic system to prime driver, officer, or rear intakes individually
  - Plumbed to the outboard side of the intake – allows priming the hardsleeve prior to opening the intake
  - Will function concurrently with and independently of the Auto function so priming can occur on both the main pump and intake simultaneously





# Pump Primer



## Additional information resources:

- Troubleshooting Guide
  - <http://www.tridentautoairprime.com/troubleshooting.html>
- Internal Operation Animation
  - <http://www.tridentautoairprime.com/animation.html>
- Trident Website
  - <http://www.tridentautoairprime.com/>

# Class A Foam System



- Integral 50 gallon Class A foam concentrate tank
- Class 1 SmartFOAM proportioning system with FoamLogix 6.5 pump
  - Four preset Class A foam injection modes
  - Defaults to “off”
  - Injection begins when the pump operator selects the desired preset mode.
  - Pump discharge pressure must be **below 200psi** with a flow of **at least 20gpm**.



## Foam solution discharges

- ✓ Both crosslays
- ✓ All four rear discharges

For more information go to:

<https://www.montgomerycountymd.gov/mcfrs-psta/driver/DriverTrainingPierceEnforcer.html>

# Class A Foam – Home Screen



Default view when pump is first engaged and returns upon pushing the “home” button on the controller. System defaults to the foam being “off” and pump is in “plain water” mode.

Operator initiates desired foam operations by selecting the corresponding mode: ATTACK, OVERHAUL, BRUSH, TRAINING.

## Attack

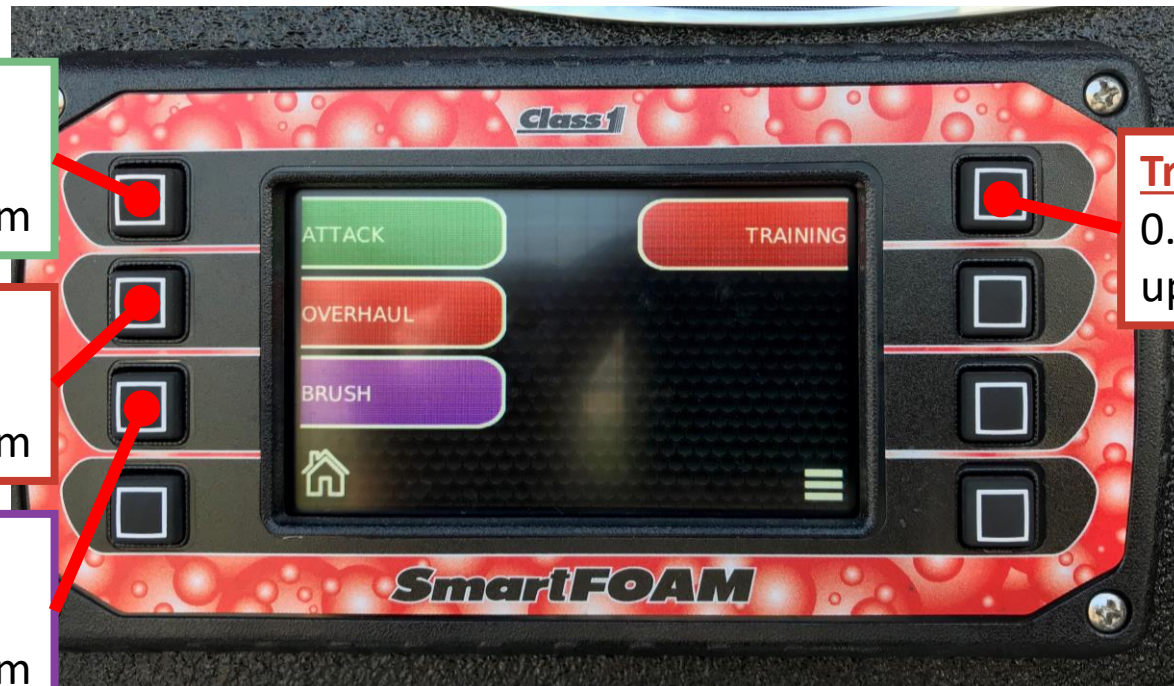
0.3% default  
up to 2,167 gpm

## Overhaul

0.5% default  
up to 1,300 gpm

## Brush

0.1% default  
up to 6,500 gpm



## Training

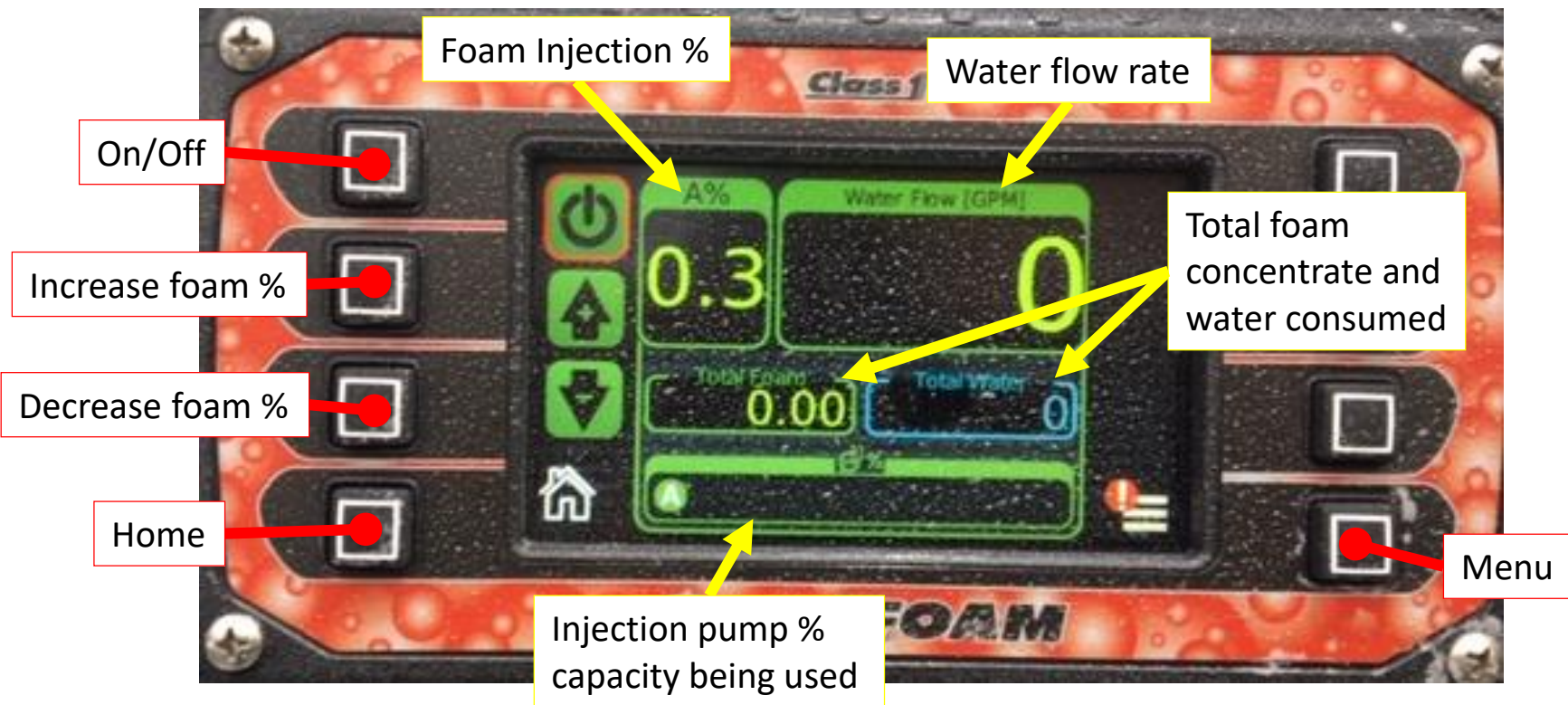
0.1% default  
up to 6,500 gpm



# Class A Foam – Operation Screen



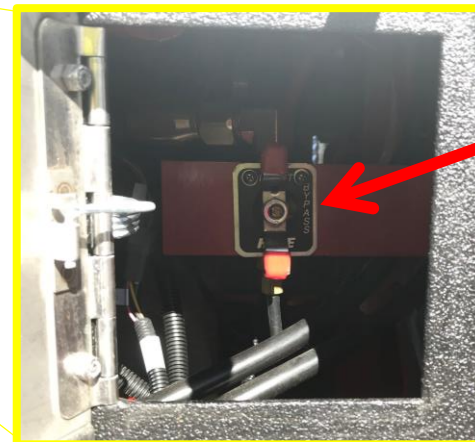
Default screen after an operation mode is selected from the home screen. Enables control and monitoring of foam solution operation. Once underway, a foam operation must be shut down from this screen.



# Class A Foam – Pump Bypass



- A bypass valve is located behind the access door on the driver's side pump panel
- Normally kept in the "inject" position
  - Directs foam concentrate into the pump
- "Bypass" is used to prime the foam pump, during foam pump calibration, or when emptying the foam tank
  - Directs foam concentrate to the ground



Bypass Valve in the normal operating position – "Inject"

# Class A Foam - Refill



- Foam refill resembles the Crimson, however there is no onboard transfer pump to intake foam concentrate
- Intake located officer side pump panel
- Bulk fill sites equipped with a transfer pump
- Must monitor the fill to avoid overflow – watch the “full” light – *there is no automatic shutoff*
- Fill plumbing drain located in front of the hose tray below the running board

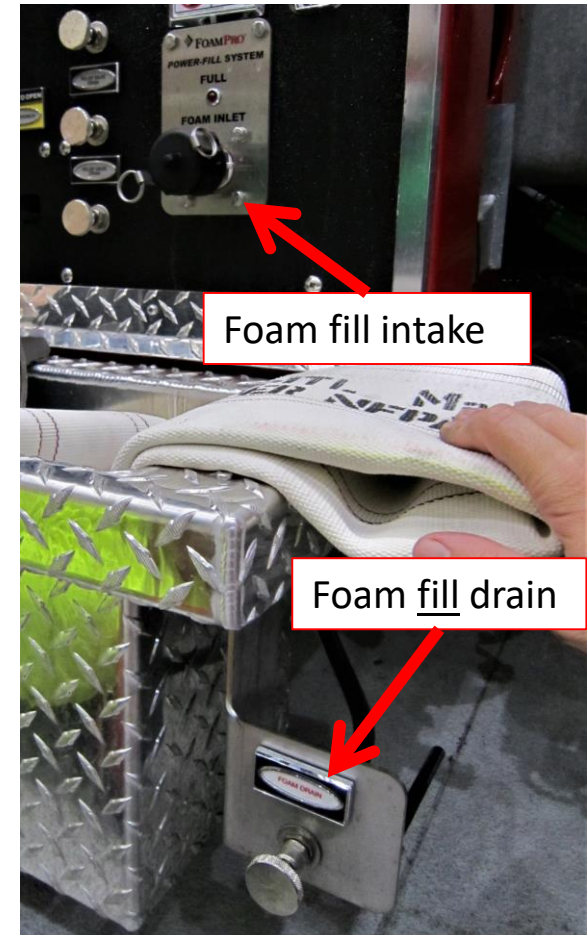
Foam tank drain –  
behind a door on the  
curbside pump panel



Monitor this light  
during filling



Foam fill intake



Foam fill drain



# Class B Foam



- There is NO integral Class B foam tank
- Class B concentrate is carried in four 5-gallon drums above the fire pump
- Class B foam requires an external eductor, 95gpm Elkhart nozzle, and foam expansion tube

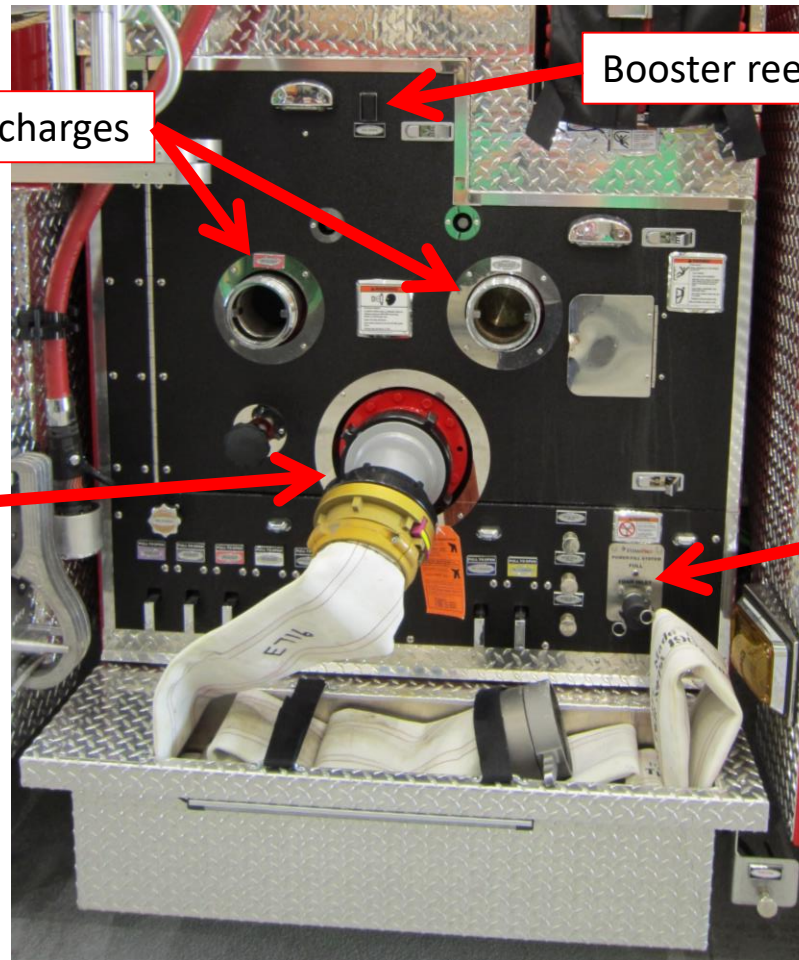


Class B concentrate



Concentration	Time to Empty 5-gallons	Foam Consumption Rate
1%	5 minutes 16 seconds	1.0gpm
3%	1 minute 45 seconds	2.9gpm

# Pump Panel – Officer Side



Large diameter discharges

Booster reel rewind

Officer side intake w/  
50' soft sleeve

Class A foam refill intake

# Officer Side Discharges

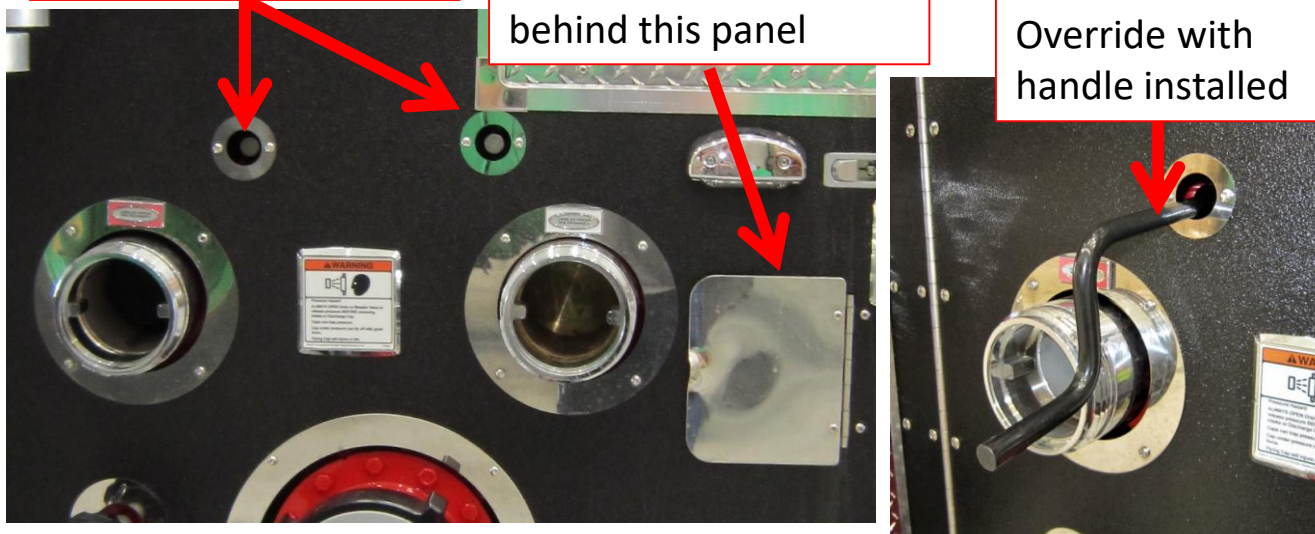


- Two large diameter discharges
- Controlled on the driver side panel
- Electric valves with manual overrides

Manual override ports

Override handle stored behind this panel

Override with handle installed



Turn override handle clockwise to open the valve. Slow and steady turns works best due to slow-open brake built into the valve.



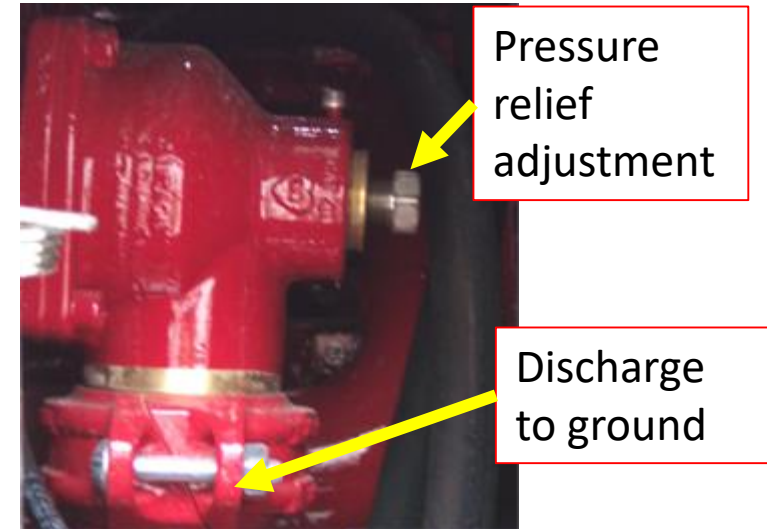
**No individual pressure relief valves integral to the discharges. Pressure is controlled only by the TPM.**



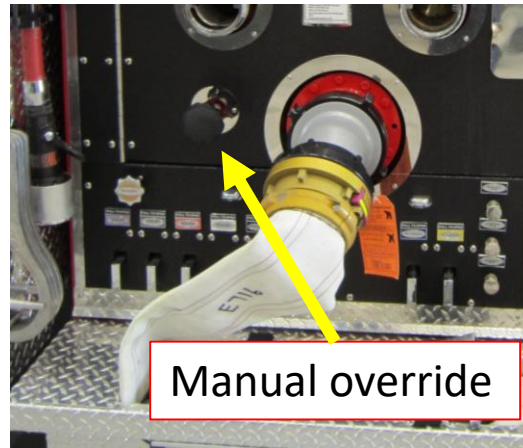
# Intakes



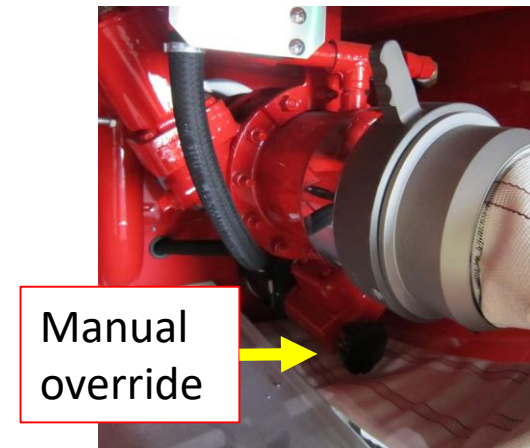
- 3 intakes – driver side, officer side, rear
- Integral relief valves
  - Factory set at 125psi
- Electric valves with manual overrides



*Driver side*



*Curbside*



*Rear*

# Tank Valves



## Tank To Pump

- Manual valve
- 3" plumbing
- Valve is connected to a reverse linkage
  - Out is closed
  - In is open

## Tank Fill

- Manual valve
- NO autofill on any intakes
- 1.5" plumbing



**No electronic or automatic valves associated with tank to pump or tank fill.**

# Hose Reel



- 200' of 1" booster line
- Elkhart Brass Chief 45gpm/100psi fog nozzle
- No individual discharge gauge
- Automatic rewind
  - Switches on both pump panels
- Blowout valve located on officer side pump panel
  - Directs pressurized air through the reel to push water out – be sure to open the nozzle to allow air and water to escape



*Reel "drain" on officer side pump panel*



Reel rewind switch





# Scene and Work Lighting



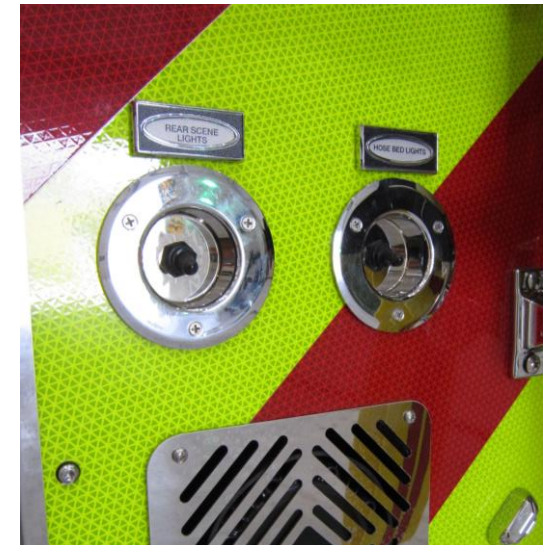
*Driver's side pump panel*



*Officer's seat overhead*



*Driver's seat overhead*



*Driver's side rear body*

**All onboard lighting is 12v DC.**

# Crosslay Area



Light controlled by "cargo light" switch on driver switch panel. Also engages with hosebed lights.



Latch to secure cover open during hose loading.

# Additional Resources



This document and other supporting documents are available at  
<https://www.montgomerycountymd.gov/mcfrs-psta/driver/DriverTrainingPierceEnforcer.html>

Members of the apparatus committee:

- Assistant Chief Pete Friedman
- Program Manager Steve Lamphier
- Battalion Chief Frank Doyle
- Chief George Brown (Sandy Spring VFD)
- Deputy Chief John Connell (Kensington VFD)
- FF Patrick Mann
- Maintenance Crew Chief Steve Neubauer

For information regarding hose loads and nozzles contact Battalion Chief David Polikoff.